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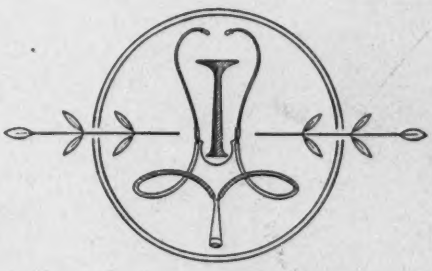

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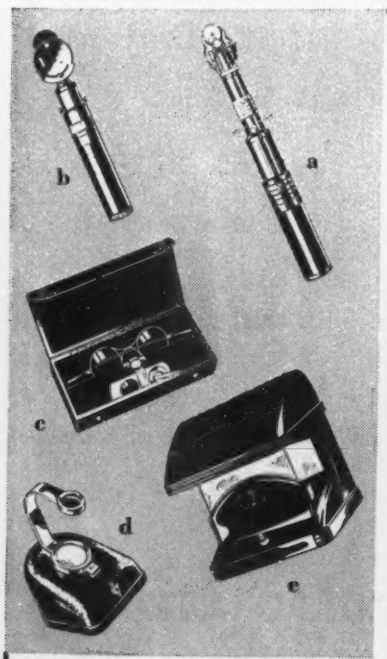

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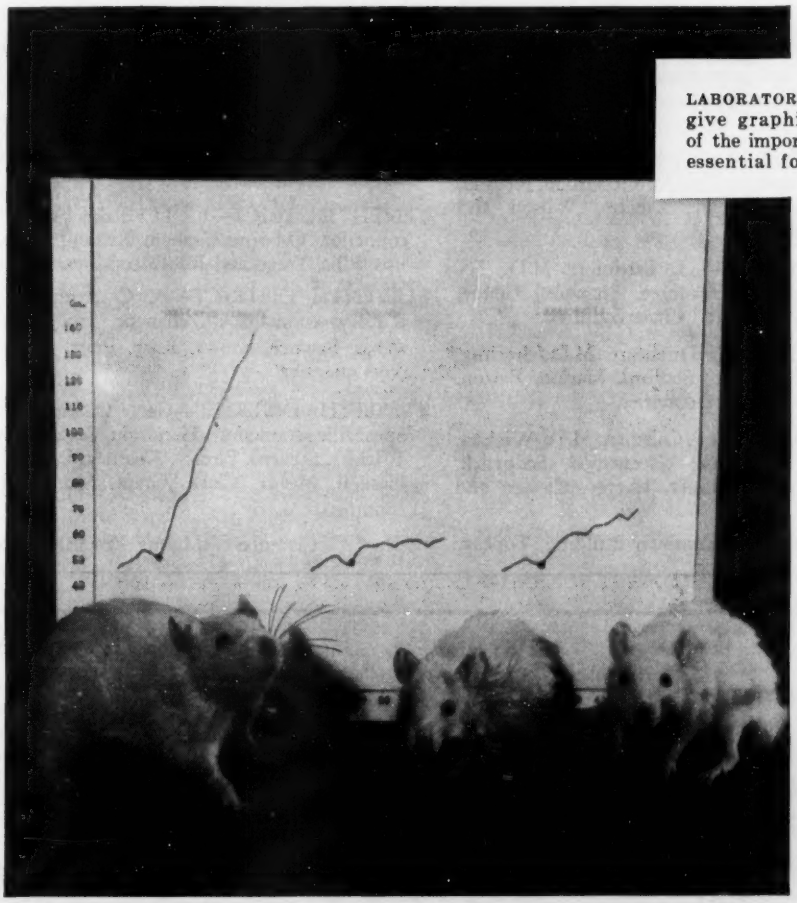

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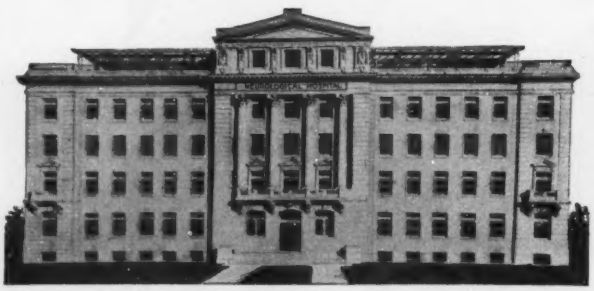

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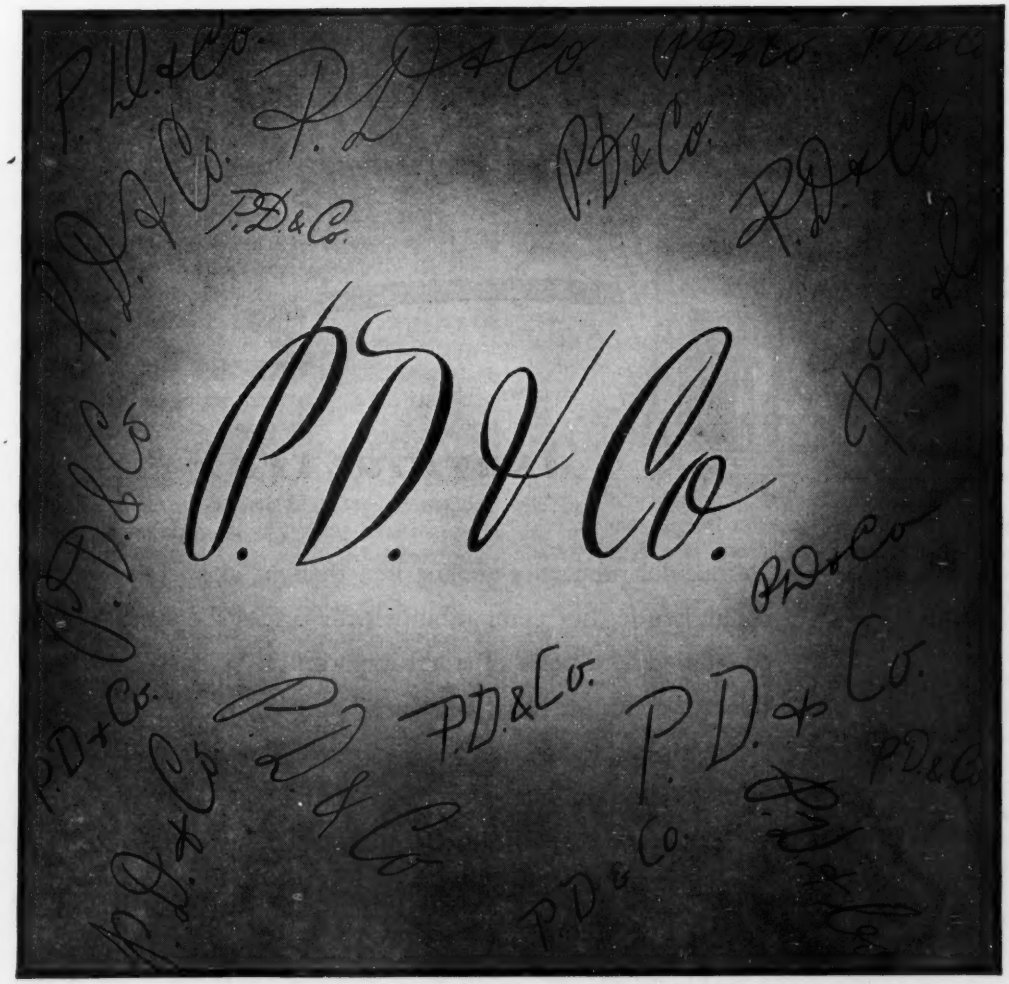
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SOME SURGICAL PRINCIPLES IN THE TREATMENT OF INJURIES AND INFECTIONS OF THE HAND*

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Chicago, Illinois

I appreciate greatly the honor of addressing your society tonight. Eleven years ago this month I had the privilege of meeting with you and in the intervening years have had the pleasure of becoming better acquainted with some of you. The years have flown by quickly, and any gaps in your ranks have been filled by a splendid group of young men starting their careers in the practice of medicine. Some of them I have known as students, and it is a real pleasure to greet them, and all of you again.

This evening, at the risk of giving a somewhat disjointed presentation, I would like to discuss briefly a few phases of the surgery of the hand that seem to me of particular importance to the general practitioner and the young surgeon, and to emphasize them with the help of a few lantern slides.

The first is the question as to what constitutes effective and efficient first aid. Too often in the presence of sudden and unexpected trouble the medical man becomes a "human being" instead of a cool and dispassionate artisan. Propelled by the urge to "do something quickly", which overwhelms most of us in the face of an emergency, by the commendable impulse to be of greatest possible help and by the urging of excited bystanders he often goes much farther than is necessary at the moment, and actually does his patient harm instead of good.

To be specific, a man plunges down a stairway and sustains a lacerated penetrating wound of the volar surface of the wrist. The wound bleeds profusely and the doctor who is hastily summoned whips a forceps from his instrument case and catches the bleeding artery. He hurries the patient to the hospital, and in the emergency room of the hospital hastily cleanses the wound and ligates the bleeding vessels. He recognizes the fact that a number of important structures are divided, and decides that he must have further assistance. Four hours after the injury a consultant sees the patient and repairs the injured nerves and tendons. Twenty-four hours later the patient's steadily ascending temperature reaches 103 degrees; the wound area is tense and swollen, and when a few of the sutures are removed thin seropurulent fluid escapes. A smear shows many diplococci in pairs and short chains.

By contrast, a second patient, a meat cutter in the stock yards, while trimming livers, cuts his left hand across the base of the thenar eminence. He is rushed to the doctor's office as quickly as possible. The doctor takes one look at the bleeding hand, covers it with sterile gauze and a pressure bandage and hurries him to the hospital. There within an hour the patient is anesthetized and the hand and forearm thoroughly washed with soap and water without removing the original dressing. When the hand is thoroughly cleansed the dressing is removed and the tissues about the wound carefully cleansed. No effort is made to wash the clean cut wound, but some of the soapy solution does enter it and run over it. Finally, the wound edges are held widely apart and the wound is thoroughly irrigated for approximately five minutes with warm salt solution. The abductor pollicis brevis is completely divided, the opponens almost completely divided. The divided muscles are approximated with mattress sutures of fine silk, the fascia is sutured and the skin closed without drainage. A pressure bandage and splint are applied. The wound heals by primary union. The patient leaves the hospital on the fourth day. He wears the splint for three weeks, until the injured muscle is soundly healed, and then returns to work.

Why did the first case become infected with virulent organisms and the second heal by primary union and without even inflammatory reaction? The first injury was a clean glass cut; the second was made with a butcher knife, used to trim livers. Animal liver is a constant habitat for the organisms of

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a b c d

Fig. 1. Crushing lacerated wound of hand with division of extensor tendons of middle and ring fingers. Soap and water cleansing; suture of tendons and repair of wound one hour after injury; primary union. a, Before operation. b, c, d, Functional result ten weeks later.

gas gangrene, and divided muscle bundles furnish an excellent medium for bacterial growth. Although I cannot prove it my belief is that the different results were due to the character of the first aid treatment. Forceps not completely sterilized, catgut ligatures applied in haste in an emergency room, interested bystanders with uncovered mouths and noses talking excitedly close to the open wound—these possible sources of infection we have come to fear more than the knife or the glass or the metal that caused the wound. Although we constantly emphasize in our teaching the importance of immediate cleansing and repair of wounds when the patient is seen within a few hours after the injury has been sustained I would not willingly attempt such repair if bleeding vessels in the open wound have already been ligated. That conclusion was reached as the result of a disastrous experience many years ago and the first case cited is almost an exact repetition of that early experience.

Without wishing to place too much emphasis on the possibility of adding virulent infection to an open wound it is my opinion that we could often be accused of gross negligence in our care of injuries. May I tell you of an exaggerated case of carelessness and its disastrous results? A few years ago a physician saw a patient with a subcuticular infection of a finger. He took scissors from his instrument case and cut away the epidermis overlying the small accumulation of pus. Because he was in a hurry he

a b c d

Fig. 2. Case 1. a, b, X-ray films of distal phalanx of left thumb twenty-three days after the onset of a felon which had been incised three times before patient was first seen. Anterior closed space was opened widely and the sequestrum simply lifted out. A thin shell of bone remained just in front of the nail. c, d, Appearance six years after operation.

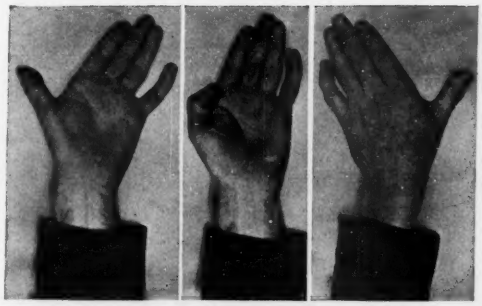


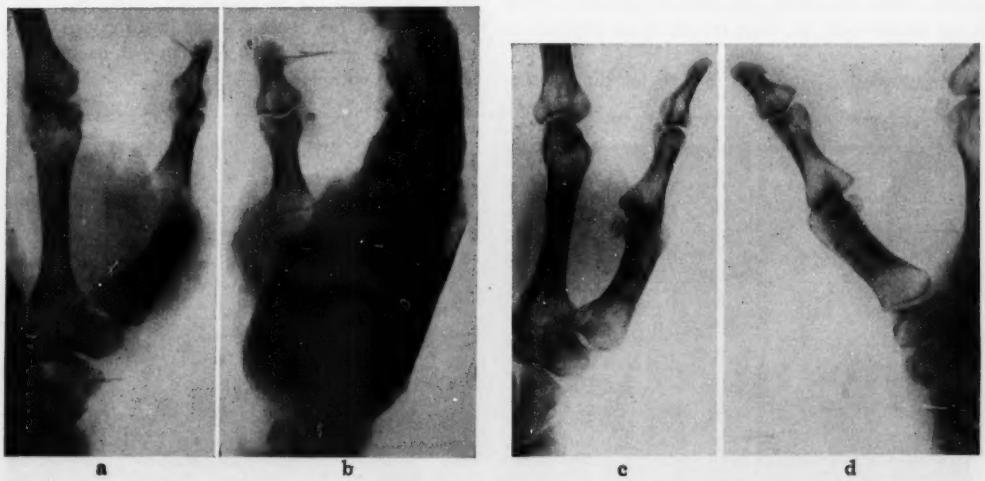
Fig. 3. Case 1. Appearance and function of thumb six years after operation.

simply rinsed the scissors under running water and dropped them into his bag. Later in the day he reached quickly into the bag and jabbed his right middle finger into the sharp scissor point. Within twenty-four hours signs of acute spreading infection developed. When I saw him forty-eight hours later he was desperately ill; the distal half of the hand was already cyanotic and insensitive; the infection had involved the entire forearm and the arm, almost to the shoulder. In another forty-eight hours the battle was over.

To come back to our starting point, and to put it concretely, what constitutes logical and efficient first aid treatment? The application of a sterile dressing over the open wound and a snug bandage; a splint if the wound is extensive or if bones are broken—and nothing more. Slight pressure will stop even severe bleeding. Direct manual or digital pressure over the bleeding wound after the sterile dressing has been applied is a very satisfactory method of controlling hemorrhage. If an extremity is involved an elastic tourniquet can usually be provided. In these days of rapid transportation there is rarely any necessity for doing more than applying a simple sterile dressing large enough to cover the wound completely, and with sufficient pressure to stop bleeding.

When the patient reaches the hospital he should be treated as any major surgical case: an anesthetic administered if necessary; a blood pressure band applied to be used as a constrictor for securing a bloodless field; a wide area about the wound carefully cleansed with soap and water; finally, the wound itself gently cleansed, and thoroughly irrigated with warm salt solution. When the cleansing process is complete, if one is convinced that he has been able to transform the contaminated wound into a clean wound, surgical repair is carried out. (Fig. 1).

Some of you may say, "I can't possibly take every patient with a compound wound or severe laceration to the hospital"; and I can realize the force of such a statement when hospital facilities are not easily available. I would only say, in the first place, that in these days of good roads and splendid transportation such an argument loses some of its force. Many a surgeon has had occasion to say, "If I had realized how serious the injury was I never would have attempted to care for it except in a hospital, where suitable equipment and expert help would have been available." In the second place I will admit very freely that one can do a perfectly "bang up" job under



a b c d

Fig. 4. Case 2. a, b, X-ray films showing involvement of bones forming metacarpophalangeal joint of thumb four weeks after patient had sustained a lacerated wound over the joint, followed by spreading infection of the soft tissues. Treatment consisted of adequate drainage of infected soft tissues, cleanly surgical care, careful splinting to secure immobilization. The bones and metacarpophalangeal joint were not exposed and not disturbed. c, d, X-ray films showing appearance of bones seven months after the injury and three months after healing of the soft tissues was complete.

a b c d e

Fig. 5. Case 2. a ,b, Appearance of hand on admission to the hospital; and c, d, e, six months later, three months after healing was complete.

trying conditions if he has the will to do it. It is not necessary to be surrounded by tiled walls and chromium plated sterilizers to carry out a surgical procedure with faultless technique, but there are certain essentials that the doctor's office or the first aid room of a factory or industrial plant do not always afford—sterile linen, sterile gloves, caps and masks to cover nose and mouth, trained assistants.

I have seen young doctors in a room fitted for first aid work attempt to remove a needle from a hand under local anesthesia. The patient continually moving the hand and disarranging the scanty covering of sterile linen; the perspiring surgeons with uncovered heads and faces bending over the blood stained hand, wondering after a half hour's search where the elusive needle could be; and the eventual result—a painful swollen hand with infection of several weeks' duration and the needle still buried in the tissues—all are vivid recollections difficult to efface.

The hospital is equipped to care for surgical patients, and unless the doctor has a fixed determination to do the job as it should be done, and the patience to carry out before operation time consuming procedures with which he would not have to concern himself in a well run hospital, slips in technique and an unsatisfactory outcome are very likely to result.

The next question is what operative procedure should be carried out in doubtful cases. If one is not certain in his own mind that the contaminated wound has been converted into a clean wound; or if the time that has elapsed exceeds the safe interval of two or three hours it is wiser, after the cleansing is completed, simply to close the wound, or even to leave it unsutured than to run the risk of disseminating infection widely by the dissection and manipulation incident to the repair of divided nerves and tendons. If the wound heals kindly nothing is lost except a few weeks' time. If infection follows the results are disastrous, as many of us have had occasion to witness with sorrow.

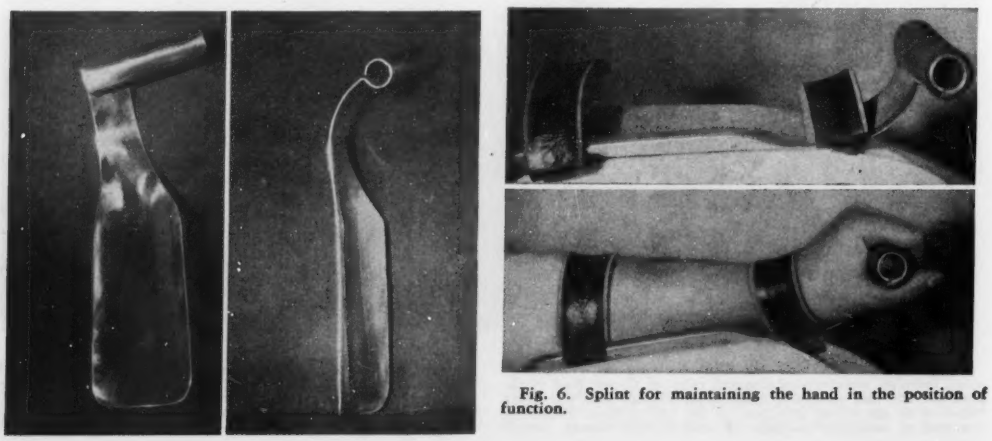
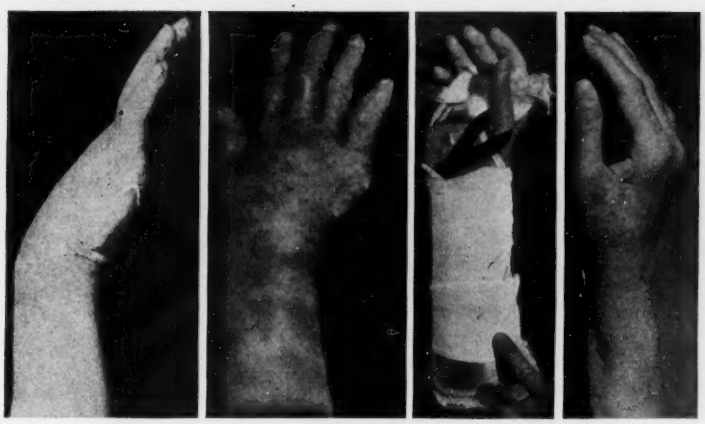


Fig. 6. Splint for maintaining the hand in the position of function.



a b c d

Fig. 7. Result of physical therapy combined with splinting of the hand in the position of function in a case of neglected infection involving the radial and ulnar bursae. a, b, Appearance and position of hand at beginning of treatment. c, Metal splint, similar in principle tot that illustrated in Figure 6, with elastic band to abduct and rotate thumb. d, Result at time wound discharge had ceased.

The third question is how long should one wait before carrying out the secondary repair that may be needed. If a wound heals by primary union it still requires about three weeks for inflammatory reaction to subside, and one cannot free nerves and tendons and draw them together easily when the tissues are still infiltrated with serum and blood cells. Rarely would one carry out secondary operation until three weeks had elapsed.

If there has been low grade infection with seropurulent discharge for a week or ten days one should wait for three months after wound healing was complete. If there has been frank suppuration one must wait six months; and if the infection has been due to a streptococcus we would not undertake secondary operation until twelve months after healing was complete. Bacteria live in the deeper tissues for a number of months after a wound is healed. To carry out an operative procedure before sufficient time has elapsed for inflammatory reaction to subside completely and for the deep tissues to become sterile is to risk complete failure.

A fourth and somewhat different question I would like to call to your attention is the problem of bone

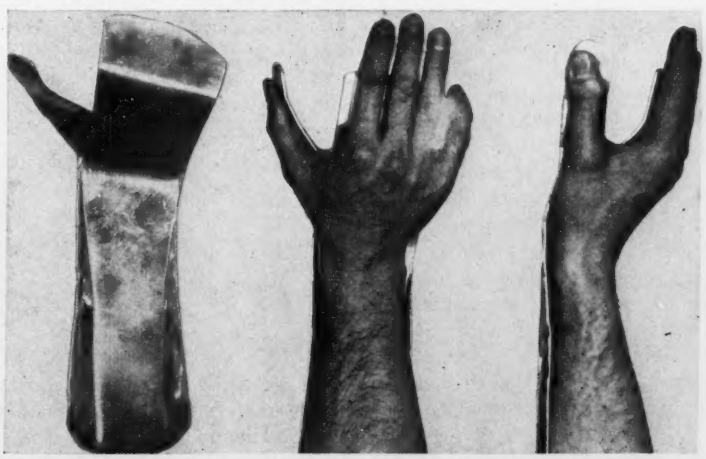


Fig. 9. Splint for supporting fingers in extension and thumb in extension and abduction after suture of extensor tendons or injury of radial nerve. By bending the distal end of the splint slightly to permit semiflexion of the fingers this splint serves equally well for maintaining the hand in the position of function.

involvement associated with infections of the hand. Some months ago I wrote a brief paper on "Osteomyelitis of the bones of the hand" which appeared in Surgery, Gynecology and Obstetrics in January, 1937. I tried in that paper to emphasize the importance of conservative treatment in the presence of osteomyelitis—in other words, of maintaining adequate drainage of the infected soft tissues, of treating the open wound with cleanly surgical care, and of leaving the bone severely alone.

For some reason, difficult to explain, the first question that occurs to many men when they see an infected finger or an infected hand is whether or not the bone is involved. An x-ray film is made and the radiologist's report is, "Periostitis," or "Beginning necrosis near tip of distal phalanx," etc. Such a diagnosis is the signal for action. The curettes, chisels and bone cutting forceps are mobilized, and the attack is carried out with vigor and directness. The result is further spread of infection, further destruction, and long delay in healing.

If anyone should advise us to open an abscess and then vigorously scrape and incise the wall of the abscess cavity you would say that such a procedure was absolutely to be condemned. Infection which involves bone is identical with infection involving the soft tissues, and the principles involved in the treatment are the same. If an abscess forms it should be drained. Necrotic tissue—the sequestrum—should be lifted out; but the remaining bone—the wall of the abscess cavity should be left alone. If localization has not yet occurred, and if there is present a diffuse inflammatory process without definite demarcation between dead and living bone operative attack is accompanied by the same dangers that are associated with operative attack upon a spreading infection of the soft tissues.

It is our belief that no one can tell by gross inspection how far infection has been carried into bone tissue, nor distinguish clearly between infected bone and normal bone. Under such circumstances the curette or chisel often carry infection into normal bone, and the possibility of recovery without partial destruction of the bony framework is definitely lessened. On the other hand, if the soft tissues are adequately drained, if the open wound is given cleanly surgical care and if operative procedures are limited to the simple removal of any sequestrum that may form preservation of the bony framework and restoration of function can result even though infection is widespread and even though both the bones entering into the formation of a joint are involved. (Figs. 2-5).

Finally, may I say a word concerning the importance of rest in the treatment of injuries and infections of the hand. Hugh Owen Thomas, the father of orthopedic surgery and the uncle of Sir Robert Jones, constantly emphasized it in his teachings. Today, almost fifty years after his death, this sound and basic principle of good surgery is often completely ignored both in teaching and in practice.

Not long ago a patient came to the Hand Clinic at the Cook County Hospital with hand carefully bandaged and fingers tightly flexed into the palm. When the dressing was removed a long oblique sutured wound over the dorsum of the hand was exposed. She said the tendons had been divided and repaired five days before. I immediately called the intern on the service and asked him why he had not splinted the hand in such a way as to relax as completely as possible the muscles whose tendons had been divided. He replied that the surgeon had instructed him not to apply a splint because he wished "to have the patient move her fingers as quickly as possible." When I asked him if he applied such treatment for fractures of the bones, and if there was any essential difference between fractures of bones and fractures of tendons he confessed that he had never thought of soft tissue injuries as comparable to bone injuries.

This is not a criticism of the young man, but of our teaching of surgery. If we are to improve in our practice it must be the older men who set the example for their interns and students.

In our own work we have found aluminum a convenient and useful material from which to fashion splints (Fig. 6). It can be purchased in sheets and can be cut in any desired size with heavy "tin snips;" and with the help of a few simple tools can be fashioned in accordance with the patient's needs. It is light and has the required tensile strength to retain its shape; it can be sterilized and incorporated in a dressing without fear of adding further infection to open wounds. It can be covered with felt and provided with straps so as to facilitate its use in patients who need "soakings," application of heat and physical therapy.

I can think of no procedures more helpful in the care of injuries and infections of the hand in our hospitals then training the nurses and interns in the cleanly surgical care of infected wounds, and providing the simple tools and the necessary material for making suitable splints that will enable the surgeon to "provide rest for injured and inflamed tissues."

SUMMARY

Thoughtful first aid treatment that does not add injury and further contamination to open wounds; in the operating room, atraumatic and patient cleansing of open wounds with plain white soap and water in preparation for surgical treatment; selection of the most suitable time for operation when secondary op-

eration is indicated; conservative treatment of infected cases in which bone involvement has taken place; careful splinting of injured and infected hands so as to put them at rest—all are important and basic principles in the care of injured and infected hands.

RADIATION THERAPY IN THE TREATMENT OF INFECTIONS

A COLLECTIVE STUDY

Lewis G. Allen, M.D.
and
P. E. Hiebert, M.D.
Kansas City, Kansas

Lafranchi[15] is credited with the statement that "No one can be a good physician who has no idea of surgical operations and a surgeon is nothing if ignorant of medicine". The use of radiation in the treatment of acute and chronic infections has been thoroughly proven and is recognized by the informed physician and surgeon as a joint ally in the management of various types of inflammatory diseases. Despite experimental observations and clinical testimony Desjardins[2] of the Mayo Clinic has pointed out that this mode of therapy has not been accorded the widespread use which the treatment merits. He theorizes that this may be due to several factors, among which may be (1) the skepticism of the profession as to the curative value of a mode of therapy which has claimed to be effective in a multiplicity of infectious states, (2) the disbelief aroused by the varied explanations of the favorable mode of action of radiation on inflammatory lesions (3) a possible fear that its use might result in permanent skin damage and finally (4) a rather generalized lack of knowledge among physicians regarding the favorable action of radiation on acute and chronic infections.

The first use of radiation in the treatment of infection was about 1902 when it was observed that certain types of infection seemed to improve after x-ray examination. The amount of exposure necessary for examination at that time was considerably more than that required at the present time and it is conceivably possible that patients did receive a sufficient amount of radiation to affect the disease. The observation, however, lead to the erroneous conclusion, now long since discarded, that the rays were bactericidal. Through the years, extensive study of the action of radiation on living tissue and cellular elements has resulted in our present conception of the mechanism by which irradiation operates in the various pathologic conditions. Desjardins[2] says "Anyone who has had extended experience with radiotherapy of acute inflammation cannot fail to have been impressed by the prompt relief of pain and rapid resolution of lesions when treated early, or the acceleration of suppuration in lesions treated later; by the fact that acute inflammations of various kinds respond at about the same rate to a given dose when treated at a corresponding stage; and by the fact that a small dose of rays is sufficient to produce this effect". He argues that since the reaction to irradiation is consistent and on so many forms of acute inflammation, it would seem logical to conclude that the lesions themselves must have some common factor. This common factor is believed to be the radiosensitivity of certain cells. Pyogenic infections are characterized by varying degrees of leucocytic infiltration. The leucocytes, chiefly lymphocytes, polymorphonuclear and eosinophils, accumulate around one or more clusters of bacteria. The leucocytic regimentation appears to be nature's method of intensifying the production of antibodies and hyperemia facilitates the mobilization and regimentation of the protective mechanisms. Of all the cellular elements in the body, the lymphocyte has been shown to be one of the most sensitive to radiation. Therefore, in circumscribed inflammations the rays act mainly by destroying a portion of the lymphocytes infiltrating the lesion or circulating in the blood vessels which supply the affected area. This disintegration of the infiltrating leucocytes results in the liberation of the antibodies, ferments or endoantitoxins contained in the leucocyte, making available a comparatively larger neutralizing dose of protective material in solution directly in contact with the organism.

Allen[1] in his collective review of the x-ray treatment of infections believes that the combination of the destruction of the leucocytes and the increased phagocytosis of the reticular cells represent the effect of exposure to the roentgen rays in localized infections and probably explains the universal action of the agent. He emphasizes as a well-known pathologic fact that there is a variation in the degree of leucocytic infiltration of different lesions of the same character or similar lesions of a different character, a fact which probably explains why some lesions respond more readily to radiation than others. A lesion characterized by marked hyperemia requires a wider exposure. Such inflammations that are not circumscribed and in which leucocytic infiltration is comparatively slight are improved by small doses of irradiation, undoubtedly as a result of disintegration of many leucocytes within the engorged vessels, liberating into the blood and tissue spaces the pro-

tective substances making them more easily available in combating the disease. This makes possible a biologic defense reaction similar to that described in the more localized inflammations.

The effect on the more chronic inflammations is theoretically explained in the same fashion with the additional fact of the greater radiosensitivity of the connective tissue cells offered by the inflammatory reaction. Chronic inflammations are characterized by varying degrees of leucocytic infiltration, connective tissue proliferation and caseous or perhaps calcareous degeneration. As would be expected, the reaction to radiation is much slower and calls for a different plan of treatment wherein the dosage is fractionated over a longer period of time. This theory has been established as a conclusion by experimental work, being in full agreement with the evidence and clinical observations recorded.

In dealing with infection, the radiation therapist must think quite differently than when dealing with malignancy. It has been repeatedly shown that the more acute the infection, the smaller the dose required to produce a resolution of the process. A more rapid absorption of the soluble substances occurs and it has been stated that the dosage should be inversely proportionate to the acuity of the infection. Early treatment is therefore essential in order to produce a more satisfactory result. Lesions treated early, during the stage of maximum leucocytic infiltration before interference with the increased blood supply has occurred and before suppuration has begun, will show a greater percentage of arrested or aborted lesions. Desjardins[2] says therefore, "The treatment is most effective when other methods are least effective." The treatment is painless and the pain of the lesion is often relieved in a few hours, although there may be a period of pain exacerbation following irradiation. It is a matter of repeated observation that treatment during the suppurative stage tends to hasten or increase suppuration. When the pathologic process has advanced and is complicated by a disturbance in circulation, the end result of irradiation will of necessity be delayed.

The radiation therapy of inflammation found its first and perhaps most effective employment in the field of dermatology. Perhaps the most simple inflammatory lesion, and at the same time the lesion invariably improved by therapy, is herpes simplex Wendel C. Hall[5] in the Pennsylvania Hospital in Philadelphia, reports fifteen cases of herpes simplex treated by x-ray therapy. In all there were twenty-one lesions. In one case a lesion appeared regularly each month with menstruation. Of course, the etiology of the lesions was usually not demonstrable. A single exposure to a comparatively small quantity of radiation caused prompt relief. Tingling, he reports, frequently disappeared within three hours and inflammatory reaction was gone in from six to eight hours. All patients were definitely benefited. Pohle[25] includes herpes simplex under the broad term of eczema of the nasal orifices, fever blisters, and herpetic lesions, all of which are common in the winter months and frequently due to continued irritating discharges from headcolds. They fall into a class of similar lesions and the majority are promptly cured by one or two applications of unfiltered radiation.

The value of radiation in the management of favus, acne, tinea, hyperidrosis, epidermophytosis and many others need only be mentioned.

Hodges and Berger[10] review their observations of radiation therapy of infection over seventeen years and classify lesions into two groups, in accordance with their suseptibility to radiation. Group 1 consists of localized erisypelas in adults, furuncles and furunculosis, granulomas, infected hemangiomas, cellulitis of certain types, lymphangitis of certain types, Mikulicz' disease, parotitis and rhinophyma. Group 2 comprises carbuncles, blastomycoses and sporotrichoses. These writers feel that all of the infections listed in Group 1 are amenable to x-ray therapy to such a degree that no other form of therapeusis is necessary in their treatment. The lesions in Group 2, however, are of such a nature that irradiation is the important auxiliary in the management of these conditions.

Irradiation therapy may be considered as a specific in the treatment of erysipelas. Small early lesions so treated disappear within twenty-four hours and require no further therapy. The temperature and toxicity in such cases are limited; edema and erythema quickly subside. The dose should be well beyond the border of the lesion in order to avoid further streptococcic invasion of the corium. Children, for some unknown reason, do not respond so well. The erysipelas complicating diabetes or nephritis is not followed by such prompt relief as when it exists uncomplicated. Extensive comparative studies using x-ray therapy, ultraviolet and medical management with an equal number of cases in each group, showed a preponderance of evidence in favor of radiation therapy. There was a reduction in the febrile days, shorter hospital stay, fewer exacerbations, less discomfort and greater economy in the irradiated group than in the other two. Hanken[6] reported twenty-four cases of severe erysipelas with no death. Treatment was begun within the first few hours of the disease and was followed, as a rule, by "a remarkable sudden decrease in the high fever and toxic symptoms". Hanken emphasizes that this treatment is completely harmless and shortens the patient's period of incapacity for work.

Furuncles and furunculosis likewise respond favor-

ably to radiation therapy. When treated early, such lesions may be completely aborted in from twelve to twenty-four hours following administration of a small dose of unfiltered rays. If more advanced lesions are similarly treated, suppuration will be hastened. Furuncles occurring on the upper lip, around the nose, and especially those accompanied by edema and of great importance from the standpoint of possible complicating cavernous sinus thrombosis, are ideally suited to irradiation treatment. Cellulitis and lymphangitis are particularly amenable to small doses of unfiltered rays. Chronic furunculosis, in which the pathologic condition extends deep into the skin with more connective tissue involvement, is best treated by the use of the more heavily filtered rays. Our most enthusiastic patients are physicians whose furuncles or carbuncles have been treated by x-ray therapy. Pertinently, we should add that incision of a furuncle or carbuncle violating the zone of protective infiltration is basically unsound.

Postoperative parotitis, which normally has a mortality of from 35 to 60 per cent shows a markedly lower rate if irradiation therapy is given early. This form of infection is most frequently found following certain operations, particularly on the large bowel, and has been a matter of grave concern until the advent of radiation therapy. The first record of the use of irradiation in the treatment of the complication is credited to Heidenhain[7] who found that it reacted much the same as other acute inflammatory processes. Rankin and Palmar[30] found that moderate doses of radium caused the inflammation to subside if treated soon after the onset; if treated later, suppuration more frequently occurred but was definitely modified, even though softening and suppuration had transpired. The only advantage possessed by radium is that the patient need not be moved. Knupfer and Hummell[13], of the University of Munich, report a series of forty-nine cases of parotitis referred for roentgen therapy following laporomy. As controls, twenty-one records of cases treated without irradiation were compared. They showed that early treatment was essential; that roentgen therapy should give good results even when suppurative softening supervened. In almost all cases, radiation was followed by a reduction of temperature and general improvement and the stay in the hospital shorter for those irradiated. In thirty-three cases, one treatment sufficed; in thirteen, a second treatment was necessary.

Conjunctivitis and corneal ulceration may rationally be treated by small doses of roentgen rays and are undergoing intensive study at the present time.

Vernal catarrh is ideally suited to the beta radiation of radium. Pendergrass and Andrews[28] of the University of Pennsylvania report thirty cases, twenty-five of which were treated by the element and twenty-five by radium emanation. Eighty per cent of these fifty cases were cured. Some danger to the operator in the application of radium element has lead to the safer employment of emanation in a specialized applicator. Reactions invariably follow the employment of beta radiation, then subside with an improvement of the disease process.

The application of radiation in infections in the nose and throat is rational and is enjoying wider application. Cervical adenopathy, tonsillar hypertrophy, adenoids, and post-pharyngeal hyperplasia are all characterized by lymphatic infiltration. The lymphocyte, in its great sensitivity to irradiation, permits employment of radiation without injury to the organs or neighboring tissues. Frequent colds or mechanical respiratory difficulties clear rapidly following radiation therapy. Maximum reduction in the tonsillar hypertrophy and in the lymphatic hyperplasia of the pharyngeal ring is noticed shortly after exposure to relatively small doses of roentgen rays. More encouraging results are seen in the pharyngeal infections co-existing with other conditions such as pulmonary tuberculosis, bronchosinusitis, chronic otitis, etc. Ninety per cent of the 147 cases reported by Torres-Carreras and Sola[29] obtained complete relief following roentgen therapy. Chronic pharyngitis, particularly in children, may be due to hypertrophy of lymphoid tissue following tonsil and adenoid operations but in whom there is not sufficient disease to indicate a second operation. Pohle[26] states that the "Symptomatic relief which the individual obtains is so definite and on the whole so uniform as to justify even the very conservative physician in recommending its use". Results of roentgen therapy in chronic infection of the tonsils is not sufficiently uniform to justify its use as a substitute for tonsillectomy in any case in which the operation is possible or reasonably safe. Children suffering from cardiac disease or tuberculosis and those who have had one or more tonsillectomies and who suffer from sore throat, bronchitis, bronchosinusitis, repeated coryza or pneumonia are ideally adapted to the excellent results which follow roentgen therapy. The fact that permanent relief from pharyngitis is not always obtained is not an argument against it. No one method of treatment in this type of case is sufficient and irradiation may be repeated if necessary in a year or two without danger or discomfort.

Pfahler and Kapo[24] analyze the results obtained from roentgen therapy of 333 cases of acute and chronic cervical adenitis. In 133 a clinical diagnosis of tuberculosis was made; in 22 the diagnosis was confirmed by biopsy. One hundred fifty-nine of the 333 patients returned for observation from which it was shown that 152 patients were cured or partially

cured, while seven did not show improvement. No more than ten treatments were given to any one patient, while the average of treatments given was from two to four.

Radiation is being employed in the treatment of infections of the middle ear. O'Brien[22] of Boston reports 140 cases of catarrhal and secondary deafness treated by x-ray between the years 1929 and 1935. Treatment was given only after customary otorhinolaringologic procedures had failed. A cycle of nine treatments of ninety r to each ear at weekly intervals was used. In eighteen of the twenty cases in which tinnitis appeared it was cured. Seventy-three of the 140 patients were benefited, sixty-five were unchanged, two were made worse.

Lucinian[18] of Miami, Florida, reports fifty cases of otitis media and mastoiditis treated by roentgen rays. Of the series of fifty, there were no complications or recurrences for as long as three years. The series included thirty-three acute, eight subacute and eleven cases of chronic otitis media. Pain was relieved following the first application of the roentgen ray. In febrile cases the temperature gradually dropped and usually disappeared in from ten to fifteen days. There was an initial increase in the discharge, followed by a gradual decrease. Acute mastoiditis did not develop in any case after the initiation of roentgen treatment. Mastoiditis was present in nine cases when radiation was started. Seven patients recovered without operation and two were operated upon. In a parallel series of twenty-five unirradiated acute and chronic cases, mastoiditis developed in nine and mastoidectomy was performed in five.

The chronic cough occurring during childhood represents another troublesome clinical problem amenable to x-ray therapy. Liebman[17] of Montreal, since 1924 has used it in 700 children in whom other therapeutic procedures were not successful. He concludes that treatment was most favorable in cough as an aftermath of pertussis or subsequent to other infections of the upper respiratory tract and eighty were definitely relieved of cough. In a separate series of seventy-seven cases, even better results were obtained. In about fifty per cent of all cases there was a definite exacerbation of the cough following the first and second treatment, its duration rarely exceeding forty-eight hours. To compare the effects of one form of radiation with another, ten children were treated with ultraviolet light but the results with roentgen radiation were so much better that ultraviolet treatment was abandoned. It was emphasized by the author that no child with a chronic or persistent cough should be treated before all etiological factors had been satisfactorily eliminated. It is the general conception that these otherwise unexplained coughs are the result of hilar adenopathy, perhaps producing mechanical pressure at the root lung not readily demonstrable radiographically. Frequently, the chronic cough is a part of bronchosinusitis and roentgen irradiation of the sinuses may successfully control paroxysms.

Rathbone[31] cites his results in treated seventy cases of chronic sinus disease in children with roentgen therapy. In this group, fifty-seven per cent were cured, twenty-eight per cent showed improvement and fifteen per cent were not benefited by the treatment. The criterion of cure was a complete disappearance of all evidence of sinus disease from a clinical and roentgen standpoint. The patients receiving the most benefit from roentgen therapy were the children with a diffuse lymphoid hyperplasia throughout the nose and throat.

Enlarged glands and swollen lymphoid tissue at the hiluses are reduced in exactly the same manner as occurs with great uniformity in other adenopathies of a similar character. In the treatment of pertussis, we believe that roentgen therapy should be regarded as an adjunct to the usual measures and may be tried in any case in which the paroxysms are unduly severe or persist beyond the usual duration.

The use of roentgen therapy in cases of pulmonary abscess appears reasonable. The infiltration of the lung parenchyma of an extent to choke off the pulmonary circulation producing lung gangrene, is relieved by proper roentgen therapy. Feinstein and Poppe[4] report the results of roentgen therapy in thirty patients with lung abscess in which recovery occurred in twenty-two and improvement in three. The patients were under observation from five months to one and one-half years. Improvement in the general condition was noted, sometimes as early as following the first exposure. On discharge, roentgen films revealed the absense of abscess or massive scar formation. These authors believe that roentgen therapy gives a high percentage of recovery and the most lasting results in recent cases of abscess of the lungs, when compared with any other methods of treatment. Porchownik[27] reports twenty-five cases of lung abscess which were observed from two months to two and one-half years treated by roentgen therapy and repeatedly examined radiographically for the confirmation of the recurrence of the process; when the abscess is eight months or a year old, granulation tissue and the thick walls of the abscess cavity, as well as the induration of the surrounding lung, prevents complete scarring of the focus. Only temporary improvement in this group can be expected by roentgen therapy. In the series in which the abcess had existed for a shorter period of time, results were uniformly satisfactory, requiring two or three series of x-ray treatments at intervals of five weeks.

Recently, the literature has included increasingly encouraging reports of roentgen therapy in pneumonia. As early as 1905-06 Musser and Edsall[21] and Edsall and Pemberton[3] reported the strikingly favorable improvements of small doses of x-ray therapy in four cases of delayed resolution. They reported that within twenty-four hours after exposure, resolution of the exudate had begun and proceeded rapidly. All four patients recovered without other therapeusis although other therapeutic measures had previously failed to improve the pulmonary condition. Since then, the observation has been repeatedly confirmed by Heidenhain and Fried[7], Holzknect[11], Merritt and McPeak[19] and others report their observations of favorable action on postoperative pneumonia as well as pneumonia unrelated to surgery. In all instances, the best results were obtained when roentgen therapy was employed early in the course of the disease. Those patients referred when in extremis have not, as would be expected, reacted in a startling manner. More recently, instances of the use of x-ray therapy in labor pneumonia have appeared. Powell[28] has reported 104 cases of lobar pneumonia including Types 1, 2 and 3 pneumococci and high types of pneumococci and other bacteria, of which only five patients died. His results in the treatment of Type 1 seem to have been better when roentgen therapy was used than with serum. His report includes most conclusive evidence of frequent essential abortion of a true lobar involvement. Frequently, the temperature and the white cell count dropped to normal in from thirty-six to forty-eight hours; occasionally, the temperature was normal within twelve hours. Resolution of the pulmonary consolidation practically always lagged behind other evidence of recovery. The only contraindication which he recognized was the definite leukopenia, particularly in influenza pneumonia.

One of the most interesting recent instances of the employment of roentgen therapy is that of Robert Levy and Ross Golden[16] of Columbia University who reported on forty-eight patients with rheumatic heart disease treated by roentgen irradiation of the heart and who have been observed during an eleven-year period. Thirty-six of the patients are living, of whom twenty-five are regarded as improved by treatment. They concluded that a definite relationship exists between the improvement and roentgen therapy. Three cases were unimproved; in eight cases, although recovery from the immediate attack ensued, there was no reason to believe that radiation played a role. Of eight patients with cardiac pain, six obtained striking relief. The number of treatments given to an individual ranged from three to twenty-five or an average of nine; twelve patients received ten or more. Four treatments were given as a series every two weeks, then a period of one, two or three months allowed to elapse and a series of four treatments was then repeated. Generally, the patients with low-grade activity and without signs of congestive heart failure appeared to be most benefited. In a number of patients, in bed for months with signs of smoldering rheumatic activity, evidence of the subsidence of carditis appeared soon after roentgen therapy was begun. Several, despite severely damaged and greatly enlarged hearts, have remained free from demonstrable active carditis for over ten years. Of the patients with cardiac pain, those with aortic insufficiency obtained no relief, whereas those without this valvular defect have been uniformly helped. This, they argue, was readily understandable since in aortic regurgitation with a large leak, the coronary flow is diminished and discomfort is due largely to ischemia of the myocardium. When the pain is due to rheumatic lesions in the heart muscle, altered reaction of the cardiac tissues may bring about their dispersion. They conclude that roentgen irradiation of the heart, in the present stage of knowledge concerning rheumatic fever, deserves a place as a therapeutic measure in properly selected cases of active carditis.

It is generally agreed that the employment of roentgen therapy in pulmonary tuberculosis should be reserved for slowly progressive, indurative tuberculosis in the early stages, given under the strictest conditions of observation and control. Tuberculosis of the cervical nodes is ideally managed by properly spaced series of relatively low dosage. Tubercular conjunctivitis or keratitis, as mentioned above, are rationally amenable to x-ray therapy and published reports claim the cure or improvement of the great majority. The treatment of tubercular peritonitis, as reported by Desjardins[2], is followed by recovery of sixty to eighty per cent. It is the general conception that the exudative type is best treated by laporotomy and other measures, while the proliferative or adhesive type tolerate roentgen therapy unusually well and treatment quickly leads to marked improvement or ultimate cure. The effect on the tuberculosis mesenteric glands, as on the tubercular cervical glands, is uniformly good.

The diagnosis of tuberculosis of the female genital tract is difficult without exploratory laporotomy and biopsy. In some instances it is reported that diagnosis made surgically is untreated and referred for x-ray therapy, because of the high primary mortality frequently the result of exacerbation of other foci in the body. A large number of authors have shown the uniformly satisfactory results following the roentgen treatment of proven tubercular adenexial disease.

Regarding the irradiation of pelvic inflammatory disease, particularly that following abortions, obstet-

rical complications and pelvic operations, roentgen therapy has much to offer. Heidenhain and Fried[8] used small doses of roentgen therapy in coccic suppurations and are enthusiastic with the results. Holzknecht[11] states that his findings agree with Heidenhain and Fried. "In about one-third of the cases the process was shortened, often to a very small, hitherto unrecorded fraction of the usual duration of illness. In another one-third of the cases, the disease picture disappeared in from twenty-four to forty-eight hours practically by crisis. Fair improvement or complete failure occurred in the remaining one-third of the cases". It is generally agreed that gonorrheal infections are best handled after the quiescence of acute exacerbation by pure surgical measures. One-third of the cases reported by Holzknect were shown to be largely of this classification.

Acute inflammatory disease of the gastrointestinal tract or of the abdomen is usually not considered as amenable to roentgen therapy. Success in the handling of other inflammatory processes might suggest the employment of roentgen therapy in acute or subacute appendicitis. However, it is the general conception that such experimentation is not warranted; that it is entirely too difficult to evaluate the extent of the acute inflammatory disease within the abdomen or to determine in any manner how imminent perforation and its subsequent danger of peritonitis may be.

More recently roentgen therapy of generalized peritonitis, particularly postoperative peritonitis, has been attempted. The development of the bedside unit will make this type of therapy easier to carry out. At the present time, however, the reports are inconclusive. Theoretically, there should be no objection to small doses of roentgen therapy over the abdomen in generalizing peritonitis.

The most prominent feature following roentgen therapy of inflammatory processes is the alleviation of pain which has lead to its employment in a variety of inflammatory lesions, as arthritis, neuritis, neuralgia, bursitis, herpes zoster, tic doloreux, sciatica and other specific types of neuritidies. Again, our most impressive results have followed the employment of roentgen therapy in the treatment of physicians who have suffered one or more of the above inflammatory processes.

Roentgen therapy has been employed in epidemic types of cerebrospinal meningitis. Koehler[14] reports two cases; Mori and Nakanota[20] report four cases; Hippe and Gruninger[9] report two cases; Schule[32] reports seven cases and several other authors refer to its employment without citing a definite number of cases. In all reports both the brain and the spinal cord were irradiated in small doses, treatment usually given daily until improvement occurred, then the interval was increased to two or more days. Almost invariably the reports indicate that improvement promptly followed institution of irradiation. The Nonne became weaker, stiffness of the neck and Kernig's sign became less positive, headaches disappeared, sleep and appetite returned. The experience is not wide enough to qualify the delimitation of the therapeutic effort to roentgen therapy alone although several of the cases reported received no other treatment or the treatment was instituted after routine medical management had clinically failed.

Finally, the employment of roentgen therapy in the treatment of gas gangrene demands mention. Kelly and McDowell (12) of Omaha are the authors of the statement that amputation is no longer required. Fifty-six cases of proven gas gangrene are reported by them with a mortality rate of 8.9 per cent. They emphasize that treatment should be begun early as a prophylactic when the disease is suspected. They are unwilling that serum therapy be omitted when roentgen therapy is employed, but doubt its requirement. They emphasize the importance of the administration of antitetanus serum and local surgical antisepsis.

It seems, therefore, that the value of roentgen therapy has been thoroughly proven and is recognized by the informed physician and surgeon as a potent ally in the management of various types of inflammatory disease. If the literature on any subject is to be given its full measure of credence, then a wider employment of radiation therapy may be expected to follow soon.

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ACID THERAPY FOR JUVENILE PYELITIS*

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Many of you will remember the earlier unsatisfactory treatment of children suffering from pyuria. Pyuria is usually known as pyelitis, but this is only a clinical characterization. Within the past three years in this country, therapeutic agents have been found which are practical and prove bactericidal for many urinary infections. These remedies have been well tolerated and are administered on a more scientific basis than any of the others previously employed.

For several years alkalinization with drugs such as sodium citrate was commonly used. It may be that we will continue to treat certain cases, especially simple acute ones, by alkalinization, which method depends largely upon a diuretic action. But even when the common urinary disinfectant, urotropin, was the accepted method of treatment, it was found to be ineffective when the urine remained alkaline. It now seems significant that we combined with the urotropin what we thought was an acid-producing drug as an adjuvant, namely acid sodium phosphate. This is not a reliable nor the best acidifier, and one may use ammonium chloride or ammonium nitrate in preference. The development of the acid types of therapy has been slow but consistently steady.

The observation was made, accidental at first, confirmed later, that certain urine, standing for days such as in the laboratory, had remained sterile. This urine had been voided by patients who had been on a high fat—low carbohydrate diet. The explanation was that such urine contained acid-ketone bodies which had a bactericidal or a bacteriostatic action, at least for certain organisms, especially the colon bacillus. Helmholz who has introduced much of the scientific study and treatment of pyelitis, found that acid urine is most bactericidal when kept at a concentration of 5.3 pH or less. The ketogenic diet[1] proved impractical for most children, since it is disliked, cannot be continued indefinitely, becomes tiresome, even produces vomiting, and thus makes difficult the maintenance of urine acidity at a constant optimal degree. The low sugar content of a ketogenic diet robs the child of adequate carbohydrates necessary in the physiology of early life.

Chronic or recurrent attacks of pyuria are apt to be due to stasis resulting from congenital narrowing or obstruction of the lumen of the ureter; to a diverticulum of the bladder, or some other type of malformation. Persistent pyuria accompanies calculus. Acid treatment has been more effective in such types of pyuria than any other palliative measure. Of course surgical cure of a stenosis or diverticulum is essential in the long run.

For several years I have been interested in the practical possibility of maintaining a highly acid urine through the simple method of adding a few simple acid-producing articles to an ordinary diet. In this way the child could have plenty of meat with some fat; as much cream, butter, bacon, olive oil and peanut butter as the child willingly takes; the urine could then be more completely acidified by adequate doses of ammonium chloride, and by certain fruits and their juices. The three fruits best known as acidifiers are plums, cranberries, and prunes. During this diet it is advisable for the short periods of the treatment to leave out of the menu all citrus fruits, and grape juice, for these have an alkaline ash and produce a highly alkaline urine.

MANDELIC ACID

In 1936, at a meeting of the American Pediatric Society, Helmholz reported his experience at the Mayo Clinic with the drug suggested by Rosenheim of England. This chemical had been known as a constituent of oil of bitter almonds and also of homatropine. Its merit as a drug in pyuria consists of its persistence, in an unoxidized state after it reaches the urinary tract, uncombined and still as mandelic acid. It was selected because of its similarity in behavior to one of the ketone bodies, namely beta-oxybutyric acid.

Mandelic acid is available in several preparations, as an ammonium salt commonly offered in a vehicle of syrup. Most of these are unpleasant to the taste. I have experimented with the aid of a pharmacist to find a vehicle which does away with objectionable taste. With the usual elixir, the addition of sufficient syrup as suggested below makes it an easy way to administer the liquid preparations. When a child

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can swallow medicine in tablet form, it is not objectionable.

Cure is usually rapid and spectacular, both in acute and in many chronic cases. The safe guards and limitations of mandelic acid administration are: the fluid intake of the child should be considerably less than 1200 cc in twenty-four hours, and such deprivation of water must not be advised when there is high fever accompanied by dehydration; the functions of the kidney must be normal, enough to permit the excretion of sufficient acid phosphate to prevent throwing the child into acidosis.

Suggested Total Amounts[2] in Twenty-four Hours.

Ammonium mandelate		Fluid Intake
Birth to 6 months	30—45 grains	1 pint
Six to 24 months	45—60 grains	18 oz.
Two to five years	60—90 grains	22 oz.
Later childhood	90—120 grains	27 oz. to 1 qt.

The twenty-four quantity may be divided into four doses, one every six hours, or into six doses, one every four hours. A standard elixir contains 124 grains of the drug to the ounce. One dram of this would therefore contain fifteen grains. The amount of the preparation for the individual child at the various ages is therefore easily computed. The author suggests that when the dose is measured out and placed in a medicine glass that an equal or even double amount of syrup or molasses be added to the medicine in the glass. This syrup may be corn, sorghum, licorice, raspberry, or wild cherry as desired.

The duration of one treatment period with mandelic acid is 6 to 12 days. Then a microscopic and cultural examination of the urine is to be made for determination of pus and microrganisms. If still positive or a relapse should occur, another course is given. Mandelic acid is not advised in severe renal damage, as acidosis may result, the drug being irritant to the already damaged kidney. In some instances the kidneys may not be able to excrete mandelic acid in the concentration necessary for bactericidal effect.

I would like to cite four types of cases treated recently:

1—Pyelitis in the Newborn—On the second day of life this boy had fever, which was accompanied by 140 pus cells in the cmm of centrifuged urine. As beginning treatment fluids were forced by mouth, and salt solution by clysis. The kidneys sometimes need to be flushed out in such cases in the first few days of life, because of uric acid infarction. This infant recovered by the establishment of diuresis alone, and so rapidly that no drug therapy was needed.

2—Relapse of Pyelitis—Betty Ann, age two years. Septic fever, colon bacillus, and as many as 200 pus cells per cmm in the urine for first seven days. Elixir of mandelic acid (drams ii) was begun. Ammonium nitrate grain v (5) was added to make the urine more acid. Both drugs were given at four-hour intervals day and night. The pH of the urine dropped from alkaline 8.6 before treatment to acid 5.1 within a day and remained there during the treatment. On the ninth day the pus cells had entirely disappeared within two days. Within a week the culture gave no growth of B. Coli.

3—This was a chronic case. This unfortunate little girl was born with an imperforate anus; a vaginal fecal fistula had been operated upon, and an artificial opening made in the perineum connected with the colon. Several months later through fecal contamination of the urethral meatus, there developed a severe pyuria, the organism found to be colon bacillus. The child entered the hospital prostrated by the infection and dehydrated by high fever. Clysis of salt solution and two and one-half per cent glucose was given at once. Sulfanilamide was not well tolerated nor effective. We then administered mandelic acid as syrup of mandelate, one teaspoonful four times in twenty-four hours. At the beginning of this treatment there were 16,000 pus cells per cmm. of urine; on dismissal at tenth day there were ten or twelve cells per high power field. She has been free of infection for months.

4—Katherine S., age nine years. She had been having recurrent attacks of pyelitis since three years of age. An alkaline producing diet was ineffective. An attack beginning May 12, 1937, was treated with tablets of ammonium mandelate seven and one-half grains each, taking two at a dose four times a day for the first day; three at a dose four times a day for the second day. Then four tablets four times a day from then on. She was given also acid producing juices. In seventeen days the urine was entirely free of pus. There was another attack in 1938. At that time we gave the elixir of mandelic acid, one teaspoon four times daily with cranberry juice. The urine became clear in seven days, and it was still free of organisms and cells two weeks later.

SUMMARY

It can be said that formerly many acute cases had not been followed through to the stage of negative culture. Relapses were common. Thorough treatment of acute cases with remedies now available will result in the reduced incidence of chronic pyelitis in children.

All acute simple cases may be treated if desired by mandelic acid. Severe pathological changes in the kidney which interfere with excretory function and cases with high blood pressure due to nephritis, are contraindicative to heroic use of acid therapy, because of danger of acidosis.

Cases during high fever do not stand such water deprivation as is necessary for the concentration of the acid in the urinary tract.

It is suggested that the simple method of checking the pH of the urine be used daily by all physicians during the treatment of such a case, in order that the best and most rapid results may be obtained.

The evolution of therapy in pyogenic infections of the urinary tract has brought about one of the greatest advances seen in modern medicine. There are various methods of acid therapy, but mandelic acid offers the best in most cases. Present treatment of pyelitis is comparable to the results offered by insulin and sulfanilamide in their fields.

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ADULT AND CONGENITAL PYLORIC STENOSIS*

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This paper will deal with pyloric stenosis in the adult and pyloric stenosis of congenital origin.

It is well to think of the alimentary canal as a continuous patent tube open at each end. Along this open tube are located various places of functional and physiological importance. The function of the alimentary canal is to render food available for use. There are only a few substances such as oxygen, water, dextrose and inorganic salts which do not have to be changed for utilization. Hence it is logical to say that any discussion of the alimentary canal involves the study of food chemistry in its relation to health and disease.

Historically, according to Osler[1], Beardsley in 1788, first described pyloric stenosis. Landerer of Freiberg, in 1879, studied in detail and reported ten cases. Maier[2], in 1885, reported thirty-one cases of autopsy with age limits of twelve to seventy-five years. Perhaps he was the first to recognize primary pyloric stenosis in adults and he believed them to be of congenital origin. Cruvielhier, in 1835, recognized a case of benign pyloric stenosis in a woman of advanced years and autopsy confirmed his diagnosis. In 1902, Meinal[3] observed a case of adult pyloric stenosis and was so proven histologically. In 1917, Urrutia[4], described one case of benign adult pyloric stenosis and in 1920, Maylord[5] described seven cases operated on for symptoms similar to gastric ulcer and found pyloric stenosis. Bastianelli[6], in 1925, describes four cases of adult stenosis found on exploratory operation and relieved by surgery. Bianchetti[7], in 1926, Crobin[8] 1928, Chaney[9], in the same year report cases of hypertrophy of circular muscles of the pylorus relieved by surgery and diagnosed as non-malignant by histological studies. Martin and Burden[10] in 1928, reported numerous cases of adult pyloric stenosis which simulated early stage peptic ulcer. Judd and Thompson[11] between 1920 and 1930, reported several cases. The Mayo Clinic[12], in 1933, report twenty cases proven at operation and having ages from twenty-three to sixty-four and symptoms from one to forty-two years. It is seen from these reported cases that adult benign pyloric stenosis is not very infrequent.

Diagnosis of adult benign pyloric stenosis is usually difficult. It is frequently associated with other diseases. Kirklin and Harris[13], of the Mayo Clinic studied a series of eighty-one cases and found fifty of these had associated diseases. Ten had duodenal ulcer; four, ulcer and duodenitis; two with ulcer and cholecystitis with stones; five with duodenitis, only twelve with gastric ulcer; one with gastric carcinoma; seven with chronic cholecystitis and cholelithiasis, three with chronic cholecystitis only and five with subacute or chronic appendicitis. The difficulty of diagnosis of benign pyloric stenosis per se is therefore quite apparent. There is usually a long history of dyspepsia with dietary measures and a prolonged symptom complex. Careful study of radiography will help considerably. McNamee[14] has found several important roentgenographic findings which are: (1) Concentric and elongated pyloric canal, the length of a normal canal usually does not exceed one cm. (2) Widening of the pyloric sulcus i.e., the space between the stomach and duodenum. (3) Constant unchanged appearance of the pylorus which is not affected by manipulation or medication.

The differential diagnosis includes (1) ulcers healed and active, (2) pyloric carcinoma, (3) pyloric spasms, (4) gall bladder pathology, (5) syphilitic lesions, (6) appendix pathology and maybe (7) functional or physiological conditions.

The gastric acidity is greatly increased in pyloric stenosis. Regurgitation of alkaline duodenal content has been proven by Mathews and Dragstedt[15], as the sole neutralizer of the gastric contents. Experimental pyloric stenosis in dogs as shown by Elman and Eckert[16], leads to spontaneous high gastric acidity interfering with normal neutralization of the acid through reflex duodenal mechanism.

There is no satisfactory known etiology. The most satisfactory explanation is that adult benign pyloric

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stenosis is due to some congenital condition activated by some cause in adult life. Bruce Morton[17] explains an abnormal nervous stimulus or abnormal responses to nerve stimuli causing spasm which long continued could produce hypertrophy. This imbalance of the autonomic nervous system leading to spasticity of the duodenum has never been proven.

Schafer[18] found that when adrenalin was injected into the supra-renal vein there occurred a spasm of the pylorus. This leads to the formation of the endocrine theory of hyper-adrenalism. Embryologically at the end of the third month, the supra-renal and pylorus become differentiated at the same time. Coincidentally the medulla is larger than the kidney and normally it diminishes in size to normal at birth or shortly thereafter. If the medulla fails to diminish there is hyper-adrenalism and this stimulus brings about hypertrophy of the pylorus with stenosis which is found predominately in the male twenty to one.

Miller and Gage[19] believe adult pyloric stenosis is due to abnormal development which constricts the space through which the duodenum passes under the mesenteric pedicle and the superior mesenteric artery. Whenever visceroptosis, atony, or stomach dilitation compresses the duodenum there results duodenal ileus.

There have been many cases reported in the literature of multiple cases of pyloric stenosis occurring in the same family. Trimble[20] in 1933, reviewed the literature in regard to hereditary causes for this condition and found twelve articles all reporting multiple cases in the same family.

The treatment of mild cases is essentially diet and medicines. Acute cases should be treated with gastric lavage preferably with a Levine nasal tube and suction. It is important to maintain the fluid balance with physiological salt solution and intravenous glucose.

In severe cases surgery is the treatment. The type of surgery depends on the type of hypertrophy. When the lesion is a tumor with a hard cartilaginous consistency posterior gastro-enterostomy may provide relief. If the hypertrophy is a ring shaped constriction it is necessary to perform some type of plastic operation; to resect the pylorus or perform the Fredet-Rammstedt operation. Most surgeons feel this latter type in adult pyloric stenosis alone has not been successful.

CONGENITAL PYLORIC STENOSIS

The most plausible etiology of congenital pyloric stenosis is a development hyperplasia. Donavan[21,22] in a series of 119 consecutive cases had two premature seven months old babies with well developed pyloric tumors which he reported in 1932. Since then he has had an additional 143 cases which he reported in the August 21, 1937, issue of the Journal of the American Medical Association.

This developmental hyperplasia is believed to be brought about by an anomaly in which the duodenum passes under the mesenteric pedicle and the superior mesenteric artery. This idea is much debated and has not been confirmed[23].

Congenital bands originating on the under surface of the liver and corresponding to the hepato-duodenal ligament called trans-duodenal bands; can cause constriction and adhesions. If these bands persist they can cause hypertrophic stenosis of the duodenum[24]. Four cases have been reported from the Jefferson Hospital, Philadelphia, Department of Obstetrics.

Another suggested cause in the more chronic stenosis is diseases of the mesentery and mesenteric glands which produces compression on the duodenum.

Birth injuries of the central nervous system and association of pyloric stenosis with megalo-ureter and Hirschsprung's Disease have been rather definitely ruled out[25]. There is no racial predisposition and it occurs most often in the first born. There is a frequent vitamin deficiency. Phimosis was advanced at one time as having a part in its production. A review of the literature[26] between 1919 and 1930, shows no proven relationship.

Garrett[27] reports in his series of cases that stenosis predominates in the breast fed and eight to one in males. He also had three cases in negro babies. It is interesting to note that he reports cases with pyloric stenosis also having hypertrophy of the stomach muscles and the lower end of the oesophagus.

Thus we see the etiology of congenital pyloric stenosis is obscure.

The symptoms are not usually marked before the second or third week of life. There are five major symptoms and signs in pyloric stenosis in babies. 1. Failure to gain in the absence of other causes as diet, fevers and infections, etc. 2. Persistent projectile type of vomiting immediately after eating and the vomitus not bile stained. 3. Visible gastric peristalsis from left to right and gastric retention. 4. Scanty stools. 5. Palpable tumor mass about the size of a large olive where the peristaltic wave ends.

There is usually a scanty urine, malnutrition, loss of chlorides due to vomiting of HC1 and possible a resulting alkalosis. There is little pain and hiccough. The stools may be fatty according to Abt[28] due to vomited bile. Most authorities believe the stenosis prevents bile entering the stomach.

Some writers lay stress on the presence of mucous in the vomitus as indicative of obstruction high up. If the stomach is greatly distended there may exist a state of paralytic distention and no visible peristaltic waves can be seen.

In pyloric stenosis with vomiting the symptoms and findings correspond to all high intestinal obstructions[29]. Certain blood chemistry changes[30] as shown at the Mayo Clinic such as high nitrogen retention, low plasma chlorides, high CO2 combining power and conditions simulating an alkalosis such as albumin, casts and decrease phenolsulphonephthalein excretion.

The treatment resolves itself into only two aspects medical and surgical. In the medical treatment the chief indication is to give a diet small in volume, very nutritious and not too rich in fat and one which would pass out of the stomach as quickly as possible. A sieved mixed diet dry as can be made is best. As long an interval between feedings as possible is better. One should try to prevent fermentation by use of carminitives. Castor oil as an aperient when needed because intestinal distension seems to be caused by fat indigestion, always in vomiting there is a chemical imbalance which I shall refer to later. Gastric lavage is to restore tone to the stomach and the emptying time of the stomach can be ascertained by passage of tube at four hour intervals.

Dehydration can be combatted by hypodermoclysis of five per cent glucose in physiological salt solution. Some authors[26] advocate commencing treatment with glycerin enema to be repeated every four to five days as needed. Gastric lavage of Na_2CO_3 drachm 1 to pint of boiled water two or three times a day until symptoms improve. A breast fed baby sometimes needs supplemental feedings of citrated milk at night. One half ounce of peptonized milk in one-half ounce water may be given every two hours with the stomach tube and later, on improvement, spoon feeding can be begun, followed with bottles of citrated milk. Cooked thick cereal to which lactose is added every two hours in small amounts, later vegetable puree, toast, butter and boiled milk with small amounts of fluids between feedings.

The following formulas have been used:

1. Pumped breast milk
   - Milk oz. 12
   - Barley flour 3 level T.
   - Dextri-maltose 3 level T.
2. Evaporated milk
   - Milk ozs. 6
   - Water ozs. 8
   - Dextri-maltose 3 level T.
3. Skimmed milk
   - Milk ozs. 10
   - Water ozs. 10
   - Farina 6 level T.
   - Barley water 3 level T.
   - Dextri-maltose 3 level T.

In making up the above, mix to a smooth paste, bring to a boil and cook in covered double boiler for half hour or until mixture has the consistency of whipped cream. The total volume should be from eight to ten ounces and have caloric value of about fifty per ounce. The first week one should feed one ounce seven times in twenty-four hours for an infant of seven pounds weight. At the completion of each feeding one ounce of tepid water should be given. A retention enema of five per cent gluocose in normal saline or ringers solution is given with a No. 14 F. catheter. If ineffective this can be given as hypodermoclysis.

Drugs familiar to all of us are atropine sulphate 1 to 1000 solution with feedings, tincture opium M 1 with bismuth gr. 5, at six hour intervals, tincture belladonna M 3, paragoric M 2, and Na_2CO_3 gr. 3, at six hour intervals for diarrhea and green stools. If after a reasonable trial when feedings of proper formulas and medications fail operative procedure should not be delayed. The average time is about forty-eight hours and then the pre-operative regime which I shall discuss very shortly should be followed.

Most authors agree that surgery is the method of treatment not only to relieve the infant but to prevent adult pyloric stenosis. Much depends on preoperative preparation of the infant and since most cases are not immediately urgent one has time to get the patient in the best possible condition. Of course early diagnosis is imperative. Vomiting has caused loss of chlorides from the blood and there may result alkalosis[30]. Starvation has caused depletion of glycogen reserve in the body resulting in ketosis. Hypodermocylsis and intravenous ten per cent glucose are very valuable. Blood transfusions ten cc for each pound of weight and in the extremely cachectic twenty cc per pound can be given. Four hours before surgery nothing is given by mouth and one and one-half hours before the operation the stomach should be washed out. The use of Na_2CO_3 to lavage the stomach has been condemned prior to surgery on the grounds there is already an alkalosis due to loss of chlorides and HCl in vomiting[30].

After the operation the baby's head should be lowered until recovery from the anesthetic, to prevent aspiration of mucous. Two hours after operation fifteen cc of H_2O should be given by a dropper. Four hours after operation four cc of breast milk with four cc barley water are given. This is increased five to ten cc every three hours, feeding until thirty cc is being taken at the end of forty-eight hours. After this increase by five to ten cc daily until total caloric requirement is met. For the first five days all feedings are given by dropper and on the sixth day the baby can be put to the breast once, then seventh day twice and so on until baby is back on the breast. The infant should get three

ounces fluid per pound body weight in twenty-four hours. Authorities agree that breast milk is the one of choice but when this is unavailable other suitable formulas can be used. One should always bear in mind that small amounts of food highly concentrated, rich in calories given at properly spaced intervals is the proper method.

The Fredet-Rammstedt operation is the type found most universally successful and the technique is well known. This longitudinal muscle cutting and separation from the mucosa was discovered by accident. Rammstedt operating on a patient found that during the course of the operation his patient suddenly went into shock and the operation was discontinued after only the muscles were cut. The incision was closed and much to his surprise the patient had a very uneventful recovery. Since then this type of operation has gained wide use and time has proven that on small infants nothing more extensive is necessary. The salient features of this operation is to leave the mucosa intact. The pyloric incision is made in the "bloodless area" or the upper part of the pylorus. All hemorrhage should be stopped and shock reduced to a minimum. It is not at all unusual for a skillful operator to do this operation in fifteen to twenty minutes. It is well to remember that the muscle fibres at the duodenal end of the hypertrophied pylorus are very thin and the mucosa can be easily perforated. If perforation of the mucosa happens a single silk suture usually suffices to close and prevents peritonitis. The mortality rates between 1915 to 1923 were about ten per cent. At present the rates are two to four per cent in most hospitals. This I believe is due to better understanding of proper pre-operative preparation and the use of the simple muscle splitting, separation from the mucosa operation. In infants gastro-enterostomy is practically never used since the Rammstedt operation has become popular.

CONCLUSION

Adult pyloric stenosis per se is a definite entity, frequently associated with other conditions and most often some form of plastic and gastro-enterostomy surgery is necessary.

In congenital pyloric stenosis there is usually a developmental hyperplasia, one surgeon finding it in premature seven month old baby. There are five major symptoms and signs and there is usually a disturbed imbalance of the blood plasma. Most often surgical interference with a simple Fredet-Rammstedt muscle splitting operation is all that is necessary. The mortality rate depends to a large extent on pre-operative preparation. Surgery should not be delayed too long, forty-eight hours in most cases after the diagnosis is made. Suggested formulas and post-operative treatment have been discussed.

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THE RELATION OF BACTERIAL ALLERGY

TO OTHER ALLERGIC CONDITIONS

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The idea of there being a distinct relationship between bacteria and states of anaphylaxis is not new. In 1907 Rosenau and Anderson showed that a definite anaphylaxis could be experimentally established by bacteria. This has been corroberated repeatedly by Krause and Doer, Holobut and Zinser, Parker and others.

The manifestations of the hypersensitive state to bacteria as shown by the skin reaction is not of the

type such as seen to be produced by other and more orthodox antigens as inhalants, pollens, foods, etc. The dermal reaction to the bacterial antigen is slow of formation and the wheal with pseudopodia and extensive area of erythema is far more apt to be the exception than the rule. This very characteristic was for a time and still is to some extent, perhaps a deterrent to the acceptance of bacteria into the society of classical allergens.

In 1917 subsequent to and backed by the work of Goodale, I. S. Walker popularized the scratch method of testing suspected persons with the proteins derived from bacteria. In some instances reactions were obtained of both immediate and delayed type. These reactions were credited with the same significance as those obtained with common food and inhalant atopen extracts. This report was enthusiastic and drew a considerable amount of criticism.

Walker's work was analysed by R. A. Cooke whose criticism of it is quoted.

> "The work has not brought forth any proof to show that his so-called positive reaction with bacterial proteins, as used by him in asthmatics, has any bearing upon the bronchial condition or is etiologically diagnostic in any individual case cited. He has only shown that asthmatics treated with a vaccine were relieved, irrespective of the reaction obtained with bacterial protein. His published results must be due to what may be considered as a non-specific effect obtained by vaccine."

Cooke working with a series of 50 cases could not confirm the work of Walker with preparations of bacterial proteins made according to Walker's own technic. In the series only two reactions were obtained and in neither of these patients could the organism giving the reaction be isolated from the respiratory tract nor could immediate constitutional reactions be induced in those or in similar cases by the subcutaneous injection of the bacterial protein giving the original reaction.

In 1920 F. M. Rackermann introduced the intracutaneous method of testing with bacterial vaccine. He was able to produce immediate and delayed reactions which he at the time thought to be specific. Later Rackermann, because his positive intracutaneous reactions were so frequent, recommended the subcutaneous use of diagnostic vaccines and the reading of the results on the basis of the delayed reactions which he considered at the time more satisfactory.

By this time Walker had become less enthusiastic about his bacterial protein preparations and had admitted their uselessness but agreed that the use of killed organisms were worthy of consideration.

In human beings allergic manifestations accompanied by immediate skin reactions to bacteria rarely occurs. However reactions do occur being usually of the delayed type as reported by Koch for tuberculin. These are known as tuberculin or tuberculin like reactions. The reason for these reactions is not clearly understood. For many years it was thought and indeed seems quite logical now as any thing presented to date, that such allergy is possibly due to the constant action of the antigenic substance arising from infection in the body. Zinser suggested that bacterial allergy might be due to hypersensitiveness to the nucleoproteins arising from bacteria as they produce tissue inflammation. What ever the mechanism is which produces this allergic state and how it operates will be discussed no further except to state that the passive transfer or the Prausnitz Kustner reaction can not be demonstrated as in the usual atopic states. This Zinser suggests is due to the fact that the antibodies are not thrown off in the blood but are possibly fixed to the sensitized cells or tissue and therefore not available in the individuals serum in sufficient amounts to produce passive sensitization.

It is my belief and substantiated by a large number of careful observers (and denied or minimized by others) that bacterial allergy does present a very important problem. The probability of bacterial allergy can not be denied even by the least enthusiastic. Alexander says the subject of "bacterial allergy is just beginning to be investigated and may be the allergy of tomorrow".

The study of bacterial allergy brings up a problem which is unique as compared to the usually considered type of hypersensitization. This is due to the fact that the conception must encompass not only the idea of the protein sensitivity but also the idea of immunity to infection which is the aftermath of the invasion of a particular organism. In the study of bacterial allergy we have to remember the relation of bacterial infection. This relationship has a different connotation than the relationship which exists between the atopic state that occurs between eggs and wheat or string beans and peanuts for example. Wherry has emphasized bacterial allergy and has said that inhalant allergy may predispose to bacterial allergy. Rich has stated that allergy and immunity to bacterial antigens can exist independently in contrast to the conception that allergy is the first step to immunity. This latter he apparently in no wise accepts.

It must not be thought for one moment that the case of bacterial allergy is thoroughly accepted in certain quarters. This has been said above. Rowe considers it a secondary factor and quite infrequently a primary state. Feinberg questions the importance of bacterial allergy. Numerous others are inclined to be skeptical. I believe one of the weaker grounds for

the skepticism is the fact that cleaning up the foci of infection does not in turn give immediate and permanent relief from asthma. It appears obvious on the face of this idea that there are too far reaching ramifications to accept it as an objection to the hypothesis without question. Huber and Koessel, Koessel and Lewis and Harkavy produce the argument that histamine like substances or less definitely defined or described products act apparently directly upon the thick net work of automonic and sympathetic nerve fibers in the nasal and bronchial tissues. Similar observations are made but it seems entirely reasonable to maintain a position which is positive in relation to the actual existance of an allergic state which is due at least to a large extent to the demonstrable sensitization to bacteria.

The concept which I hold and which at present seems logical is briefly and simply as follows:
lows:

The individual at one time or another has an upper respiratory infection after which time he has very frequent colds or sinus disease and becomes sensitive to the bacterial protein. At this time the presence of an allergy probably could be demonstrated by the study of the nasal smear as described by Hansel. Later after his "flu" or bronchopneumonia or sinusitis which is the trumpet blast which razes the last wall of allergic resistance he appears with his characteristic allergic story. The nasal symptoms follow in an unmistakable form in its wake. This in our experience has occurred in individuals with other allergic states. Without wishing to appear too bold it has definitely occurred to me that the opponents of the concept of bacterial allergy have denied on the basis of questionable premises. That a sensitization can be established at a very definite time has been observed. It is why this state is established at this given time that is as important as that it is established.

I have briefly intimated a defense of the concept of bacterial sensitization and have to this point approached it as a well defined entity. This may be in some instances. It has, in our experience, been noticed in conjunction with the other sensitizations. In only one instance have I been able to find no other source of trouble suggested in a history or in subsequent skin tests. It has been quite interesting to note the frequency of the associated sensitization to fungi and bacteria.

We have considered each case which presented particularly any upper respiratory manifestation as a possible bacterial sensitization. With pronounced frequency they have been skin positive. It might be said that we do see negative reactions to bacterial antigens.

It is rather difficult to present this subject in a sound and unchallengeable way for it must be admitted that all factors are taken into consideration in the therapy.

I shall now briefly present a few cases which to me seem to be highly suggestive of bacterial allergies. Most of these are associated with other types of allergic manifestations which does not weaken the case.

CASE I

Mrs. E. who is forty has complained over a period of three to four years of nasal blocking. This has been perennial and unassociated with any environment except that drafts make her worse. There are no other allergic manifestations. She had been subject to severe colds for the two years previous to present difficulty. She was found skin sensitive to pork, rice, turnip, radish, cabbage, cauliflower, apple, chocolate, potatoes, egg plant and lettuce. She showed sharp positive intracutaneous reactions to bacterial allergens as well as trichophyton and alternaria. She has been comfortable on combined treatment and is now on a treatment-free period. She has reported that she has had a slight cold but the constant long period of discomfort characterized by nasal blocking and sneezing long after the "cold" has been absent.

CASE II

Mrs. B. referred by Dr. H. W. Powers was seen. All skin tests were negative except scratch tests to colon typhoid group, streptococcus and pneumococcus group. Intracutaneous tests to fungi were negative but very dilute mixed bacterial antigen showed a sharply positive delayed reaction. She was returned for further nasal or sinus treatment. This patient was particularly interesting in that she at least appeared to be sensitive solely to bacteria and will probably clear nicely after surgical intervention.

CASE III

L. L. age eleven seen February 20, 1937. She was in a combination of disagreeable states. She had a definite asthma which was relieved by adrenalin. After relief postural drainage was productive of large amount of white clear drainage. Her mother gave the history of asthma after every bout of upper respiratory infection. She thought cats made her worse. No foods were blamed. She was found skin positive to a number of foods and three plus to cat hair and one plus to dog hair. She reacted sharply to intracutaneous bacterial antigen and on one occasion had a systemic reaction before leaving the office.

She was treated with this material and diet. She improved and since treatment had some mild colds

or suggestions but no subsequent asthma has occurred.

During recuperation she was given some codliver oil and had considerable respiratory difficulty, she was then given halibut liver oil which resulted in a similar upset. She had been mildly sensitive to extracts of cod and halibut.

The fact that asthma does not occur as frequently after upper respiratory infections as it did before hyposensitization to bacteria is quite interesting.

I believe that this is the result of desensitization to bacterial protein and the increase of bacterial population is better handled by the individual which comes with an acute infection. With this hyposensitization her immunity has been increased with its naturally following assistance.

CASE IV

J. P. age six, referred by Dr. M. G. Sloo and seen October 1938. Began to have trouble at the age of one year which was characterized by frequent colds. These would last about two weeks and then would be followed by severe asthmatic attacks. During winter when she gets warm then cools would have asthmatic attack. Thinks eggs and pineapple cause trouble.

During infancy had some eczema and last year had pneumonia.

General physical examination negative except for very noisy chest.

She was found to be mildly skin sensitive to wheat, rice, rye, barley, corn, cauliflower, apple, peas, navy beans, celery, parsnip, potatoes, and egg plant. She was sharply sensitive to bacteria in very weak dilution also to alternaria and slightly less to trichophyton.

She was taken off of all suspected foods. Because of her history it was thought that there was considerable inability to adjust herself to thermal change, so thermal treatment was given. She has also been given vaccine and fungus extracts. Her trouble has quite definitely improved and a few days ago her mother reported that a severe upper respiratory infection had occurred which was not followed by asthma as was invariably the case previous to the present regimen.

Therapy as applied to these individuals is on the basis of our findings. Certainly the foods, inhalants and contactants are dealt with as they arise. Adequate treatment of all diseases of the nose and para nasal sinuses should be carried out so far as possible. Vaccines are used as an ordinary antigen should be used. We have reason to believe that the regimen as would apply to the pollen treatment of hayfever is definitely indicated. Frank seasonal hayfever which shows a sensitization to bacteria as indicated by skin tests is given bacterial antigens as are the fungus, food or heat sensitive cases. It is difficult here to refrain from discussing this last condition but suffice it to say that we have considered it for some years as an important factor in bacterial allergies.

SUMMARY

(1) A review of some of the ideas held concerning bacteria allergy has been presented.
(2) Personal concept briefly stated.
(3) Cases presented which seem pertinent.
(4) Therapy has been briefly discussed.

CONCLUSIONS

That bacterial allergy can be considered as an important factor in allergic manifestations of the respiratory tract.

High Concentrations of Sulfanilamide Most Effective—High concentrations of sulfanilamide will inhibit the growth and multiplication of bacteria, Perrin H. Long, M.D., Eleanor A. Bliss, Sc.D., and W. Harry Feinstone, B.S., Baltimore, state in their article, "Mode of Action, Clinical Use and Toxic Manifestations of Sulfanilamide," in The Journal of the American Medical Association for Jan. 14.

With severe infections, capable of being cured by sulfanilamide, it is important to attain an effective concentration of sulfanilamide in the blood as soon as possible. The authors advise that a large initial dose of sulfanilamide be given in order to bring about the desired level of ten milligrams per every 3.3 ounces (100 cc.) of blood as quickly as possible and that this level be maintained by doses of the drug given at intervals of four hours both day and night.

In severe infections the administration of sulfanilamide should be discontinued only if severe complications occur.

In the case of milder infections, levels of sulfanilamide in the blood of from 5 to 10 milligrams are generally adequate to bring the infection under control. Here again it is also important to maintain an even concentration of the drug and giving it at intervals of four hours is best.

If the patient cannot swallow tablets, if vomiting is present or if the sulfanilamide is not readily absorbed from the gastrointestinal tract, the drug can be injected.

The amount of sulfanilamide per pound of body weight required to establish adequate levels of the drug in the blood is considerably greater for children than for adults. This is due to the fact that children take more fluid per pound of body weight than do adults, and when fever is present this difference is even more marked.

Sulfanilamide has produced many toxic complications. Among the most common ones observed in human beings are loss of appetite, nausea, vomiting, dizziness and headache. Alcohol is contraindicated during sulfanilamide therapy, as it tends to accentuate cerebral disorders. Patients who are receiving sulfanilamide should be warned against driving automobiles, because the dizziness and decreased mental acuity sometimes seen may render them dangerous on the road.

Because of the toxic complications the patient should be carefully supervised, hospitalized whenever possible, while sulfanilamide is being given. The patient who is receiving sulfanilamide needs the intelligent and careful supervision of a physician.

PRESIDENT'S PAGE

To the Members of The Kansas Medical Society:

I have on my desk The Kansas City Medical Journal announcing the program of the Annual Spring Medico-Military Symposium which was held March 13 and 14 in Kansas City, Missouri. Also The Wichita Medical Bulletin announcing their Spring Clinical Assembly, held March 21 and 22. Apparently these programs were excellent and I trust as many as possible attended these meetings.

We also have a Bulletin from Shawnee County Medical Society showing their efforts as host for our Kansas Medical Society Annual Meeting, to be held in Topeka, May 1, 2, 3, 4.

However, at this time, I am wondering if the membership will go to Topeka with a spirit of gladness of work well done, or with a feeling of remorse. It is up to you!

Never before has there been a greater opportunity or a greater need for each and every member to do his full share, in order to maintain the prestige of medicine in Kansas.

I have always contended and always shall, that the success of any undertaking of The Kansas Medical Society is wholly dependent on the local societies and its individual members.

We still have a big job ahead. May I urge that every member extend himself to the utmost to the task assigned right now! In two more weeks or sooner we will have the answer.

N. E. Melencamp, M.D., President.

EDITORIAL

ACTIVITIES IN MEDICAL HISTORY

The January issue of the "Bulletin of the History of Medicine" announces an important expansion of its function in becoming the official organ of the American Association of the History of Medicine.

Beginning in 1933 as a small supplement to the Johns Hopkins Hospital Bulletin, two years later it became a separate publication under the editorship of Dr. Henry E. Sigerist. The magazine has steadily grown in importance in the field of medical history and has reflected the scholarship of its editor and the excellent work being done in the Institute of the History of Medicine at Johns Hopkins University.

At the annual meeting of the American Association of the History of Medicine, an official publication was authorized by the new constitution. At the October meeting of the council of the association it was decided to make The Bulletin of the History of Medicine the organ of the association. The magazine will remain the property of the Institute. The editor, Dr. Sigerist, is also an officer in the association, and will, it is announced, work in close co-operation with the council of the association. There will be monthly issues for ten months of the year. An important section will be devoted to medico-historical news and activities.

For those whose interest in medicine leads into the field of medical history the Bulletin will be found of value because of the excellence of the material being chosen for publication and for news of activities being carried on in this field of research.—R. B. S.

THE TRAINING OF INTERNISTS

Since the establishment of the various specialty boards there has been an increase of interest in the training of young medical graduates. In a recent address before the Congress on Medical Education and Licensure, Dr. J. H. Musser, Professor of Medicine at Tulane, pointed out the need for properly trained internists, listed the five different methods by which this training may be attained and suggested the development of additional facilities. He states that while there are many institutions specializing in one certain field of medicine which offer ample training in the clinical aspect of the specialties there are few devoted exclusively to internal medicine and the number of residencies available are exceedingly limited. The point is made that there should be more internists trained than those for the other specialties, because more people go to the internist than to other specialists.

The possibilities for instruction, according to Dr. Musser, include: 1. University fellowships. 2. Clinical fellowships. 3. Hospital residencies. 4. Preceptorships. 5. Formal graduate training.

The most satisfactory method of training Dr. Musser considers to be a fellowship in a medical school. Here the fellow may qualify and ultimately obtain a degree of Master of Science, or even a Doctor of Philosophy. From two to five years may be spent in such a fellowship. Here graduate students receive a salary sufficient for self-support.

Clinical fellowships are obtainable in a few excellent clinics throughout the country. They are usually for three years.

Hospital residencies are open only to a limited number. These appointments are, in most hospitals, not of sufficient duration to allow for the amount of training required by the American Board of Internal Medicine. However, there are University hospitals where residents may move up in rank each year until a full residency has been attained in one or another department. The criticism is made that too often in hospital residencies there is insufficient supervision.

Dr. Musser makes the suggestion that hospital residencies may be developed into places of superior training. He believes that a very much larger number of hospitals can be made available. There are now only 212 such residencies offered in internal medicine.

Dr. Musser advocates the revival of the preceptorship method and shows the advantages to both the teacher and student.

In graduate training in a school of graduate medicine, Dr. Musser raises the objection that there is

too much formal teaching. The graduate student, he believes, should be put more on his own initiative and be permitted to develop himself under proper tutelage.

Young graduates whose interests lie in internal medicine should be given every encouragement to continue their study in view of qualifying for the American Board of Internal Medicine. Men of such training must take the place of the general practitioner in the near future.

The development of graduate training in the voluntary hospitals as Dr. Musser suggests, should be encouraged. Here the young physician may be trained in a way that the university or charity hospital cannot do. Here he will come into contact with patients who demand his respect and cultivate his tact. His work will be under the direct observation of staff members who will exercise wholesome supervision over his progress. There should be greater opportunities offered for study and a minimum of routine required.

The preceptor method might well be combined with graduate training in a voluntary hospital. Here the preceptor, a qualified internist, may teach his student by precept and example the ways to approach the analysis of clinical cases and the methods of managing them. He can direct his student in the pursuit of knowledge and teach him the ethics and courtesies that should characterize a doctor of medicine.

Many hospitals not associated with medical schools carry on valuable educational work. All such hospitals should respond with enthusiasm to a program of advanced clinical teaching. The value of the hospital to the community should be increased and the effect upon the medical profession in the locality should be elevating.

Special emphasis should be given to the fact pointed out by Dr. Musser, that money and an aristocratic background is not at all important to a young doctor who wishes to qualify himself for a speciality in medicine. He may be without money, but if he is willing to undergo some sacrifice for a few years, he can live in comfort while taking advantage of the advanced educational facilities open to him for graduate study.—R. B. S.

CANCER CONTROL

RECENT ADVANCES IN X-RAY THERAPY*

Lewis G. Allen, M.D.

Kansas City, Kansas

The recent advances in roentgen irradiation consist primarily of improvement in the detail of the application of the x-ray therapeutically rather than basic alteration of methods previously employed. Expressed in a sentence, radiation therapists are now convinced more than ever before that their chief problem consists of the delivery of the proper quantity of radiation at a quality that will be absorbed by the tissue to be treated.

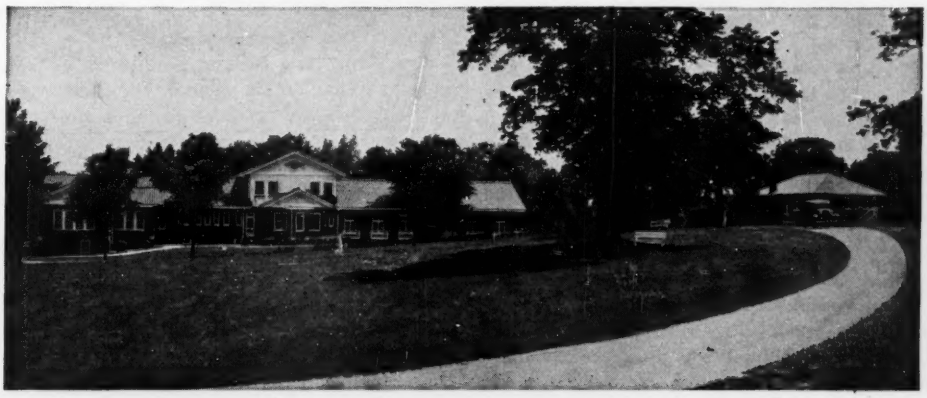
Our conception of radiosensitivity and radioresistance has undergone modification. The simple axiom of Bergonie and Tribondeau, as stated in 1906, that embryonal tissue is most radiosensitive and therefore tumors so characterized should assure hopeful results has not always been borne out. The evaluation of the patient and his disease now seems of first importance; cell type forms the basis but its location in relation to its blood supply, tumor bed, and accessibility to radiation together with the age of the patient and other clinical features are modifying factors of ultimate prognosis. The modern radiation therapist must correlate the histologic and clinical findings to properly plan treatment. Regaud, Lacassagne, Stewart, Borak, Coutard, Desjardins and others have shown how essential this correlation must be to insure success in any radiation effort.

The matter of dosage is still undecided in detail and standardization seems distant. The fixing of the international unit has contributed to a standard conception but it is unlikely that a thumb-nail rule will ever be realized in radiation therapy any more than in any other branch of clinical medicine.

The matter of supervoltage has stimulated the interest of all, and the imagination of perhaps too many. "Reports emanating currently from clinics where this form of therapy is employed leave its value still within the realm of conjecture." Radiologists of experience in both report that there are few advantages possessed by radiation by supervoltage that cannot be approached, if not duplicated, by the present universal type of high voltage apparatus of 200 K. V.

Critical comparisons of clinical results employing the large radium cannon as an evidence in favor

*Presented before the Spring Medico-Military Symposium, Kansas City, Missouri, March 29, 1938.



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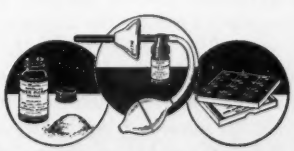

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of supervoltage have, on the whole, been disappointing.

Freedman's comparison of the large and small radium bomb or cannon showed no advantage of the larger over the smaller and no improvement in clinical results over 200 K. V. x-rays in the treatment of laryngeal cancer.

It has been clearly shown, therefore, that x-rays generated at super-voltages have no selective action on cancer cells. Only the advantage of economy of time in administering an equal depth dose favors the higher voltage. Apparatus operating at or near 400 kilovolts is now being offered by manufacturers at less exorbitant cost and it is reasonable to believe that such apparatus may increase the range of usefulness of radiation therapy by complement rather than substitution.

One of the advances in the study of quality has been the demonstration of the difference in the appearance time of the epithelite and the epidermite by changing the wave-length. The body repairs an erythema from the softer radiation at a greater rate than it does from a more penetrating type. As an example, a full erythema dose given at 200 K. V. filtered through 0.5 millimeter copper will reach its peak on the sixteenth to eighteenth day, while if the filtration is two milimeters of copper, the erythema will reach its peak on the twentieth to the twenty-second day. This fact is of importance in planning operations following preoperative irradiation as well as showing tissue reaction to the quality of radiation.

Coutard has shown that in addition to the regularity in appearance time of the reaction, there is also a periodic sensitivity of laryngeal cancer and suggests the same property in all malignancies. He observed that the cycle of epithelial reaction to radiation corresponds with the cycle of greater activity of cancer cell life in those cases in which results were most favorable. He plans, therefore, because of this periodic sensitivity to administer rather intensive doses of irradiation in short, recurring series, or daily administration of subintensive doses protracted over thirty, forty or even more days. Such a plan will avoid the administration of a large amount of the treatment during the period of repair when, theoretically at least, the treatment would be less effective.

Warren has recently shown concrete results of increased responsiveness of heated neoplastic tissue following irradiation by x-ray. His experimental data demonstrates that combined fever and x-ray therapy prove of real value in animal cancer but the effect on human beings has not yet been proven.

Crabtree found that the destruction of glycolysis by irradiation is different in tumors than in normal tissue and that the end result of radiation was due to a series of physical and chemical metabolic changes. An exact knowledge of these fundamental cell changes may lead to a more effective system of radiation therapy.

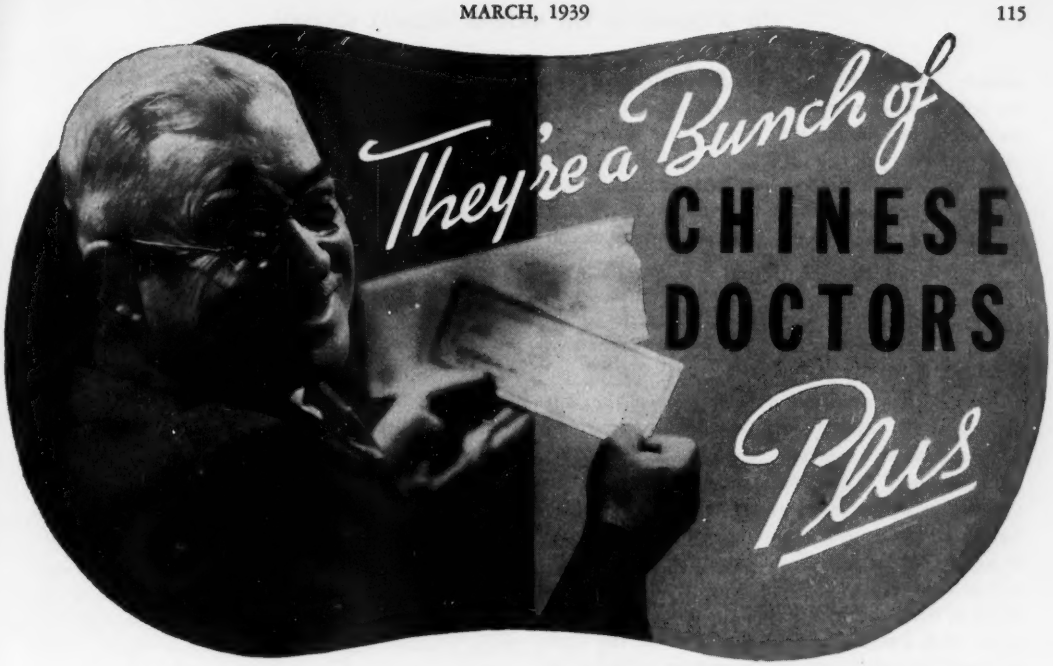
One of the most pleasant features of our developing knowledge of the value of the therapeutic use of x-ray has been its success in the treatment of benign conditions. Long erroneously accused as a contraindication, selected inflammatory pelvic diseases may now be successfully handled by radiation therapy. Encouraging reports are found in the literature of its value in peritonitis. Functional amenorrhea, dysmenorrhea and menorrhagia when intelligently selected, are ideally handled by roentgen radiation. Its value in the treatment of fibromyomata has convinced most of its critics. Its dominant position in dermatology opened the greater field of infection where it has been popularized by Desjardins. The recent report of Powell and others of its use in the treatment of lobar pneumonia stimulates more than passing interest. The great value of its use in the treatment of gas bacillus infections should be emphasized. Kelly's recent report commands its employment in all gas-infected cases without exception. His enthusiastic accusation that the omission of its employment in cases ending fatally constitutes malpractice, does not appear so radical to some who have witnessed its obvious great value.

There can be no question that x-ray therapy is becoming more and more a procedure of choice in the treatment of thyrotoxic conditions. It controls the disease as well as surgery but without surgery's associated mortality and morbidity. Harris and Rose correctly rate irradiation as the safest and most effective method for treating certain types of hyperthyroidism.

The value of roentgen radiation as a palliative agent in many painful conditions is finding supporters in increasing numbers. Perhaps heralded too loudly in the treatment of arthritis, it has proven of palliative value in selected cases. Many of the neuritides, both inflammatory and malignant, are entirely relieved by comparatively small doses of x-ray. Its effect in herpes zoster, tic douloureux and trifacial neuralgia is at times immediate.

If treatment is instituted early in surgical mumps, progress of the infection may be prevented or the complication aborted entirely. Roentgen treatment of erysipelas reduces the duration of the febrile stage by more than one-half. The pain of furuncles is reduced and suppuration is hastened when treated late and occasionally aborted when treated early. Those clinicians interested in diabetes are the greatest supporters of roentgen radiation of this complication and physicians themselves diabetics, are truly missionaries.

Margraf recently reported the effect of roentgen treatment of puerperal mastitis in 118 cases as compared to a parallel series of 127 cases treated conser-



A lot of my patients joke with me about the Chinese Doctors who are supposed to be paid for keeping patients well, and rebate when they fall ill. I've found a real bunch of "Chinese Doctors"—the EMPLOYERS MUTUAL LIABILITY INSURANCE COMPANY. They plug away with Safety Engineering work every minute to keep everybody well.... they pay their expenses—medical and living—if they are hurt.... and then, by Jove, they go the Chinese Doctors one better by giving back part of the premium to policyholders at the end of the year as a dividend!

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vatively, spontaneous healing occurred in ninety-two per cent of the roentgen-treated cases when treatment was begun within the first twenty-four hours; and in eighty-one per cent when treated within forty-eight hours (but before abscess formation), both figures to be compared with seventy-one per cent spontaneous healing when treated by the usual conservative measures.

The treatment of patients presenting clinically negative chronic cough as reported in a series of 700 cases by Liebman in which eighty per cent relief was obtained, is worthy of mention.

Recent advances have further proven the conception of the advantage of the combined treatment of carcinoma of the cervix. The recent report of the British Cancer Commission emphasizes this statement. The tendency is away from the interstitial use of radium, with greater emphasis on less trauma of topical and intracanular application supplemented by roentgen radiation. We have now reached the place in the treatment of this disease when we can agree with Pearson's recent analysis that the cause of death in carcinoma of the cervix is due to its associated complications.

Much has been written recently on the advantage of a more comprehensive classification of breast cancer, particularly for the benefit of case analysis and recovery percentages. The plan of treatment of breast cancer approaches standardization. In a recent compilation from the literature, we found that statistics covering many thousand cases warrant this statement. Breast cancer patients, when untreated, live an average of thirty-four months and twelve per cent live five years; of the group accepted, operated upon and given x-ray treatment postoperatively, 47.7 per cent live five years; of all the third group, most of which were relatively advanced when first seen and who were treated preoperatively and postoperatively, 51.3 per cent live five years. Furthermore, recent statistical studies qualify the opinion that cancer of the breast occurring in women of forty years of age or older whose tumor is slowly growing in the breast, unattached to the skin or chest wall, without palpable nodes or evidence of distant metastases, is a primary surgical problem to be treated by postoperative x-ray if pathological findings warrant the conclusion that the disease is more extensive than clinically believed. All other cases are primary roentgen radiation problems. The younger woman whose tumor is localized in the breast should be operated upon after preoperative radiation and cases whose disease was more advanced when first seen should be operated upon when, as the result of roentgen radiation, the disease has been reduced to an operative stage and then followed by postoperative radiation. It is the present conception that the palliative operation is unjustified.

The work of Herrell, Smith and others bear out the current belief that ovarian function is an important factor in carcinogenesis of cancer of the breast, that pregnancy and no doubt menstruation, increases the stimulus to breast carcinoma growth. Therefore, suppression of menstruation by roentgen sterilization seems not only justified but definitely indicated. Isolated instances of distant metastatic lesion disappearance following surgical removal of the ovaries or roentgen sterilization have served to emphasize the indication of the procedure.

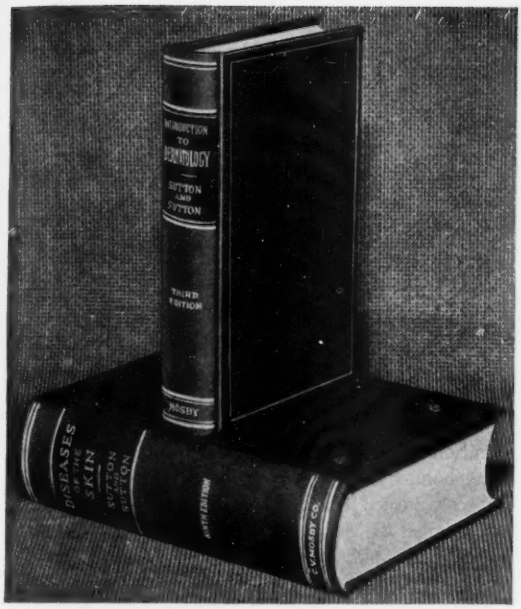
Teleroentgen therapy, meaning the exposure of the entire body at relatively long distances as applied to cases of Hodgkin's disease, leukemia, polycythemia vera, etc., is being tried with some, but relatively unimpressive success.

Cancer occurring in the mouth and tongue is showing improved curability statistics since the advent of radium-mold applicators and combined x-ray irradiation and now appears to enjoy greater promise from the application of Pfahler's and Coutard's plan of protracted roentgen radiation to both the primary lesion and regional node extension.

Likewise primary cancer of the lung is being treated by protraction on the theory of periodic sensitivity and longer maintained saturation with improved curability statistics.

Increasingly numerous reports are being made of cases of cancer of the esophagus which have been healed by irradiation. So far, only cases of involvement of the upper two-thirds have been successfully handled but no case has ever been successfully treated by any other method.

Experience in radiation of bone tumors qualifies rather definite conclusions; osteochondromas show no response; giant-cell tumors are relatively sensitive but not equally so because of so many variants. Bone cysts show little or no response. Chondrosarcomas are slow growing tumors and tend to remain localized; they are only moderately sensitive in any case and are best treated by a combination of surgery and x-ray therapy. Endothelial myeloma of Ewing is the most radiosensitive of all bone tumors; they may disappear entirely but frequently recur as distant metastases. Multiple myeloma is sensitive but a disease so widespread that it can be controlled only for a limited period. Osteogenic sarcoma are, as a class, extremely resistant; periosteal fibrosarcoma seems to respond better. In the Registry of Bone Sarcoma, 80 patients are found who have passed the five-year period. Of these, 42 were cured by surgery, 35 by surgery and irradiation and three by irradiation alone. Primary malignant bone tumors are obviously a combination surgical



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and radiation problem. Metastatic bone tumors may, and frequently do, show complete regression and recalcification and it appears that the effort should be made more frequently.

The scope of this discussion must of necessity be limited to those more common or illustrative pathologies. Never in the history of the specialty of radiation therapy has case study been more carefully recorded and reported. Three comprehensive treatises by Americans on clinical radiation therapy have been published in the last year. The recent First International Congress of Radiology, held in Chicago, wherein each paper delivered on five consecutive days was translated and shown concurrently in three languages illustrates the worldwide intense interest and study the specialty is receiving.

Proof of the value of any procedure of treatment of cancer will come slowly. Time is the essential in evaluating any plan or method. Roentgen irradiation is contributing importantly and judging from the past, much more is to be expected.

EYE, EAR, NOSE & THROAT

BRAIN ABSCESSES*

Ernest E. Tippin, M.D.

Wichita, Kansas

A. P. a white male age sixteen, took sick August 9, 1937 with a slight cold and a pain in his forehead. The next day there appeared a swelling in the center of his forehead which was very tender to touch and about the same time his left ankle began to pain him.

He dragged around a week, gradually feeling worse.

On August 19 the physician in charge called me in as he thought a frontal sinus infection had produced an osteomyelitis of the frontal bone.

The boy appeared toxic and was very irritable, which his mother stated was contrary to his usual disposition, even when ill. He had a temperature of 103 degrees F. There was a fluctuating swelling above his glabella about two inches in diameter. His left ankle was swollen and tender but no fluctuation. I could find no gross pathology in his nose. The only thing in his history that I could elicit of special interest was the fact that he had bumped his head on the bottom of the pool while diving, about ten days before the onset of his symptoms.

*Read before the Kansas City Society of Ophthalmology and Otolaryngology December 15, 1938.

He was sent immediately to the hospital and an x-ray of his head was made and a spinal puncture done. Both were normal.

The abscess on the forehead was then opened. The culture from this was reported as staphylococcus aureus.

Complete physical and neurological check up revealed no further pathology.

He ran a typically septic temperature for eight days and then continued normal. At no time did the pulse rate drop below normal. Repeated blood counts averaged 13,000 W.B.C. with seventy per cent polys.

On September 19 the abscess on the forehead suddenly reformed after being apparently healed for several days. X-ray was again negative. The question of osteomyelitis of the frontal bone was considered and on opening the abscess widely, the condition of the bone did not seem to justify a resection. The abscess healed quickly and he was discharged on September 27 apparently well, except for some soreness in his ankle on walking.

On October 6, he awakened his mother about 3:20 a.m. in a convulsion which she described as a violent jerking of all the muscles on the left side of his body but when seen about 6:00 a.m. the only objective neurological symptom present was a slight weakness of the muscles of the left arm. Reflexes normal. The eye grounds were normal. Subjectively he complained of a very severe headache and the skin of the forehead was tender and slightly edematous over an area about two inches in diameter. This area was opened and a small portion of the bone beneath was resected, but since the dura beneath it appeared normal there seemed to be no justification for a search for a possible brain abscess.

For four days he seemed to be improving then suddenly he developed all the classical symptoms of violent intracranical involvement and died October 12.

Autopsy revealed frontal sinuses normal as well as normal dura over frontal lobes. There was a well encapsulated abscess in the right frontal lobe completely surrounded by apparently normal brain tissue and a second abscess about twice as large as the first in the right temporal lobe, which was not so well encapsulated.

Cultures from both abscesses revealed staphylococcus aureus.

For the fifth consecutive year, the psychiatric staff of the Menninger Clinic, Topeka, Kansas, will offer a week's postgraduate course in Neuropsychiatry in General Practice, April 17-22. This practical presentation of psychiatry through lectures and case presentations has been attended by physicians from nineteen states in the past four years. Enrollment is limited to thirty. Address inquiries to Dr. Robert P. Knight, Menninger Clinic, Topeka, Kansas.

RECENT ADVANCES IN THE SCIENCE OF NUTRITION

VII. The Unknown Vitamins

● The past twenty years of biochemical research have steadily brought additions to the list of vitamin factors known to be indispensable in proper human nutrition. Today, only vitamins A, B_1, C and D, riboflavin and the P-P factor are universally considered as essential to man. In general, the requirement for these factors is greater in certain phases of the human life cycle than in others.

This list of essential factors is probably incomplete. It has been aptly stated (1) that our species has evolved in the direction of lengthening rather than shortening the list of known dietary essentials. However, it is reasonable to believe that the above list, although incomplete, probably does include all factors whose absence from the ration may cause the most severe types of human dietary deficiency disease.

Investigations on the nutritive requirements and the biochemistry of the lower forms of animal and plant life constitute the frontiers of modern vitamin research. From studies such as these may come the first clues as to new vitamins which may ultimately be proven essential in human nutrition. For example, it was upon research of this type that the dietary requirement of the rat for riboflavin was established and the importance of riboflavin (1) in human nutrition postulated.

During recent years, a large number of factors essential to animals other than man has been enunciated (2). As examples might be mentioned the factor in plant juices required by herbivora (3); the factor in fresh meat essential to trout (4); and vitamin K, needed for normal blood coagulation in fowls (5). Whether these or others of the factors essential to lower forms of life will also prove indispensable to man, the future must decide.

The knowledge that our present list of essential vitamins may be incomplete, need not be alarming. However, such knowledge should serve to emphasize the desirability of a diet formulated according to the best present concepts of the science of nutrition. Nature intends that man should receive all dietary essentials, known or unknown, through food and it will be through the medium of a judiciously chosen, varied diet that these essentials can best be obtained. Needless to state, the several hundred varieties of wholesome, nutritious, commercially canned foods lend themselves admirably to formulation of such varied, protective diets.

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(1) 1938. J. Amer. Med. Assn. 110, 1278.
(2) 1938. Ibid. 110, 1441.
(3) 1936. Proc. Soc. Exper. Biol. Med. 35, 217.
(4) 1928. Science. 67, 249.
(5)a. 1935. Nature. 135, 652.
b. 1935. Biochem. J. 29, 1273.

We want to make this series valuable to you, so we ask your help. Will you tell us on a post card addressed to the American Can Company, New York, N. Y., what phases of canned foods knowledge are of greatest interest to you? Your suggestions will determine the subject matter of future articles. This is the forty-sixth in a series, which summarize, for your convenience, the conclusions about canned foods reached by authorities in nutritional research.

The Seal of Acceptance denotes that the statements in this advertisement are acceptable to the Council on Foods of the American Medical Association.

NEWS NOTES

LEGISLATION

The following is a report of several legislative matters of interest to the medical profession.

HB 147, the osteopathic bill introduced in the House permitting the practice of medicine and surgery by osteopaths, was brought out of the House Committee on Hygiene and Public Health without recommendation on March 8. The vote thereon was five to four. This action terminated eight weeks of study and consideration by that committee which included several hearings and an inspection trip to the osteopathic school at Kirksville, Missouri, and the University of Kansas School of Medicine at Rosedale. The committee made no amendments to the bill. It did however, include two amendments requested by the osteopaths themselves. One of these amendments pertains to the right of osteopaths from foreign countries to obtain reciprocity. The other amendment, which is entirely inadequate for the purposes claimed, was contemplated to have the effect of restricting osteopathic privileges. Neither amendment in any way affected the complete practice of drug therapy by osteopaths. The measure at the time this article was written, was pending on the House Calendar with approximately one hundred prior bills awaiting action.

SB 171, the osteopathic proposal in the Senate, was killed by the Senate Committee on Temperance and Public Health on March 10. The vote thereon was three to nothing with the fourth member not voting (the Chairman not being permitted to vote except in case of a tie). The Chairman of the committee, Senator C. A. Richards of Nemaha County, who is one of the sponsors of the measure, has served notice that he will attempt to have the action of the committee overridden by the Senate. This action requires a two thirds majority of that body.

HB 44, a proposal relating to the establishment of a Board of Naturopathic Examiners and containing many far reaching provisions in the field of medicine and surgery, was killed by the House Committee on Hygiene and Public Health on March 8.

HB 222, which includes certain increased standards and regulations for the practice of optometry and the fitting of eye glasses by doctors of medicine and which was approved by the Society has passed the House and is now pending in the Senate.

HB 404 which provides that chiropractors shall attend at least two days of postgraduate instruction each year has passed the House and is now awaiting action in the Senate.

Several other measures of interest to the medical profession and now pending are a proposal requiring compulsory vaccination as a precedent to school entrance; a measure transferring all official state board funds to the state general fund (would include the Board of Medical Registration and Examination); a bill which would give the Board of Regulations the effect of law over certain regulations (would also affect the Board of Medical Registration and Examination); a proposal permitting hospitals to maintain liens in connection with judgments which include compensation for hospital services; a bill pertaining to the licensing of psychological consultants; a section in the Probate Code which improves the status of medical claims against insolvent states; a section in the Corporation Code which continues the present prohibition against corporations practicing medicine and surgery; a bill prohibiting the sale of barbituric acid preparations without a physicians prescription; a bill controlling the sale of narcotic drugs.

Two other measures of unusual interest were prepared but not introduced. One of these permitted non-profit corporations to engage in the provision of group hospitalization services. The other enabled certain corporations to participate in pre-payment medical and hospital service.

80th ANNUAL SESSION

Plans for the 80th Annual Session to be held in Topeka in May are almost complete. The committees are hard at work to make this one of the most entertaining and instructive sessions in the eighty year history of the Annual Meetings of the Society.

The program is excellent. This committee has secured nationally known enthusiastic teachers for every hour of lectures during the four day meeting. The following are the names of the speakers who have consented to date, to attend the meeting: Dr. Claude D. Head, Jr., Washington, D. C.; Dr. Will S. Horn, Fort Worth, Texas; Dr. J. M. Martin, Dallas, Texas; Dr. Waltman Walters, Rochester, Minnesota; Dr. Arnold S. Jackson, Madison, Wisconsin; Dr. Julius Jensen, St. Louis, Missouri; Dr. Roy R. Grinker, Chicago, Illinois; Dr. Jay Arthur Myers, Minneapolis, Minnesota; Dr. A. D. Prangen, Rochester, Minnesota; Dr. L. J. Birsner, St. Louis, Missouri; and Dr. Joseph L. Baer, Chicago, Illinois. The committee is giving special attention to the schedule of talks so that every physician who attends will have the opportunity to hear the guest speaker he desires.

The popular noon round-table luncheons and the alumni banquets will be repeated. The following schools have made arrangements to hold alumni banquets: University of Kansas School of Medicine; Kansas City College of Medicine and Surgery; Kansas Medical College; Rush Medical College; Northwestern University Medical School; Washington University School of Medicine; St. Louis University School of Medicine; Creighton University School of Medicine; University of Nebraska College of Medicine; University of Louisville School of Medicine; and State University College of Medicine. These banquets will be held on Tuesday, May 2. Announcements of additional school banquets will be made in the April issue of The Journal.

Entertainment has not been neglected. The trap and skeet tournament and the golf tournament will be held at the Topeka Country Club on Monday, May 1, and the stag banquet following the tournaments will climax the day of sport activities. The annual banquet on May 3, will be held at the Topeka High School followed by a dance on the roof garden of one of the Topeka hotels.

The scientific exhibits, commercial exhibits and all lectures will be held in the Masonic Temple where there is adequate space to accommodate the entire session. The following commercial exhibitors have accepted booth space to date: H. J. Heinz Company; Petrolagar Laboratories, Inc.; Mead Johnson & Company; Medical Protective Company; General Electric X-Ray Corporation; Philip Morris & Company; Midwest Surgical Supply Company; Gerber Products Company; Parke, Davis & Company; A. S. Aloe Company; J. B. Lippincott Company; Jones Metabolism Equipment Company; Eli Lilly & Company; H. G. Fischer & Company; Quinton-Duffens Optical Company; The W. E. Isle Company; Lederle Laboratories; C. B. Fleet Company; A. J. Griner Company; Burroughs Wellcome & Company, Inc.; Coca-Cola Company; Holland-Rantos Company, Inc.; M. & R. Dietetic Laboratories, Inc.; The Zemmer Company, Riggs Optical Company; Denver Chemical Mfg. Company;

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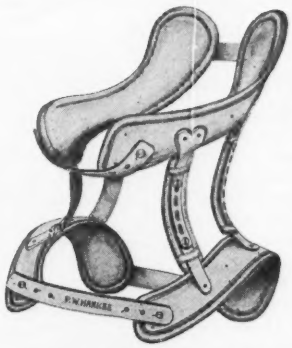

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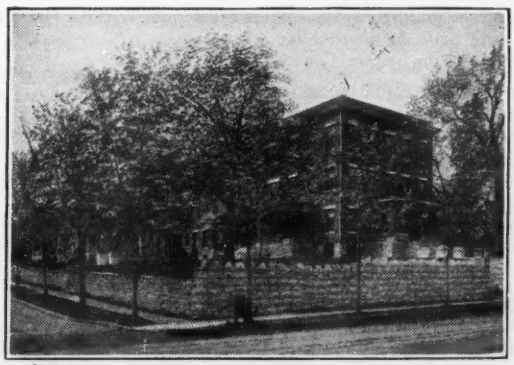

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Hotel reservations should be made at an early date and the following hotels will be happy to serve every member of the Society: Hotel Jayhawk, Hotel Kansan, Capitol Hotel, Commerce Hotel, Throop Hotel, Fifth Avenue Hotel, and the Reid Hotel. In the event members have difficulties in locating hotel reservations, Dr. Harry J. Davis, Mills Building, Topeka, who is chairman of this committee, will be glad to make arrangements in this matter.

Entertainment for the physician's wives will include a summer fashion show presented through the Crosby Brothers store of Topeka; a tea for the visiting women; and a day at the Woman's club for those who wish to attend, as guests of the Auxiliary.

Committees of the Shawnee County Medical Society for the 1939 State Meeting are as follows: J. L. Lattimore, M.D., General Chairman; M. B. Miller, M.D., General Treasurer.

Program—L. R. Pyle, M.D., Chairman; L. E. Eckles, M.D.; J. G. Stewart, M.D.; O. R. Clark, M.D.; W. W. Reed, M.D.; H. W. Powers, M.D.

Scientific Exhibits—F. C. Taggart, M.D., Chairman; A. J. Brier, M.D.; Leo Smith, M.D.; S. H. Boyd, M.D.

Commercial Exhibits—J. T. Hunter, M.D., Chairman; O. M. Raines, M.D.; C. E. Joss, M.D.; B. J. Ashley, M.D.

Golf and Trap Shoot—E. H. Decker, M.D., Chairman; H. T. Morris, M.D.; B. I. Krehbiel, M.D.; F. L. Loveland, M.D.; F. C. Boggs, M.D.; R. J. Miller, M.D.

Banquet-Entertainment—H. L. Kirkpatrick, M.D., Chairman; G. L. Kerley, M.D.; L. L. Saylor, M.D.; H. H. Woods, M.D.

Accommodations—H. J. Davis, M.D., Chairman; G. F. Helwig, M.D.; C. K. Schaffer, M.D.

Arrangements—Guy Finney, M.D., Chairman; J. D. Bowen, M.D.; D. C. Wakeman, M.D.; L. A. Curry, M.D.

Publicity—H. L. Clark, M.D., Chairman; P. M. Powell, M.D.; H. B. Talbot, M.D.

DEATH NOTICES

Dr. Francis Garner Emerson, 78 years of age, died at his home in Wellington on February 12. He was born in Afton, Iowa, and attended the grade and high schools there. He attended the Iowa State University and received his medical degree in 1885. He began the practice of medicine in Wellington and remained there until the time of his death. He was an honorary member of the Sumner County Medical Society.

Dr. Hubert C. Hannah, 64 years of age, died at his home in Junction City on February 14. Dr. Hannah was born in Kirksville, Missouri in 1875 and received his medical education at the Washington University Medical School in St. Louis, Missouri. He was graduated in 1897. He was a member of the Golden Belt Medical Society and the Geary County Medical Society.

Dr. George Knowlton Janes, 78 years of age, died at his home in Williamsburg on February 17. Dr. Janes was born in 1860 in Palmyra, Missouri, and received his grade school education in Honeywell, Missouri. He attended Missouri Medical College, St. Louis, and was graduated in 1884. The same year, he located in Williamsburg and continued his practice of medicine until the time of his death. He had practiced in Williamsburg for more than 55 years. He was an hororary member of the Franklin County Medical Society.

Dr. Joseph H. McGauhey, 78 years of age, died in a St. Joseph hospital on February 8. He was a resident of White Cloud. Dr. McGauhey was born in 1861 and attended the Missouri Medical College, St. Louis, Missouri, receiving his medical degree in 1888. He had practiced in White Cloud for over fifty years and was an honorary member of the Doniphan County Medical Society.

POSTGRADUATE COURSES

The following postgraduate courses will be held on the dates and places described below:

The seventh and eighth course on obstetrics and pediatrics opened for four weeks beginning March 20. The Kansas State Board of Health through funds furnished by the Social Security Act has worked in cooperation with the Society to make these courses possible. The guest speakers for the seventh course are Dr. William F. Mengert, State University of Iowa and Dr. John H. Randall, State University of Iowa on obstetrics; and Dr. Jean V. Cooke, Washington University, and Dr. J. D. Boyd, University of Iowa, on pediatrics. The seventh course will be held in Beloit, Smith Center, Hays, Ellsworth and Abilene.

The eighth postgraduate course will have as guest speakers, Dr. William J. Dieckmann, and Dr. M. Edward Davis, Chicago Lying-in Hospital, in obstetrics; and Dr. Mandel L. Spivek, Children's Memorial Hospital, Chicago, in pediatrics. The towns which will present the course are Leavenworth, Sabetha, Clay Center, Wamego, and Lawrence. The county medical societies will act as hosts for the meetings held in their towns.

The postgraduate program on venereal disease, also sponsored by the Kansas State Board of Health in cooperation with the Society started on March 9 and will continue through April 21. Dr. J. V. Van Cleve, Wichita, is the speaker for this course and the following towns have been selected as hosts for the course: Holton, Ottawa, Chanute, Great Bend, Marion, Winfield, Eureka, Clay Center, Colby, Hays, Pratt, and Dodge City. The local county medical society will also act as hosts for these meetings.

A postgraduate program on cancer control began on March 20 sponsored by the Kansas State Board of Health. The speaker for the course is Dr. Nathan A. Womack, St. Louis, Missouri. The places selected for the course meetings are Emporia, Wichita, Great Bend, Hays, Manhattan, and Lawrence.

There will be afternoon and evening sessions for all courses. All the courses are open without charge to all licensed doctors of medicine.

A. M. A. MEETING

The 1939 meeting of the American Medical Association will be held in St. Louis, Missouri, May 15-19. All members of the Association are invited to attend and hear the lectures of nationally prominent physicians from all over the country.

This meeting is of great importance to every member of the A. M. A. and any physician in Kansas who is able to attend will find many advantages in the trip.

Hotel reservations should be made within the near future, inasmuch as the prominence of this meeting will bring physicians from all parts of the United States to attend.

All Kansas doctors are urged to make a reservation to attend the meeting in St. Louis.

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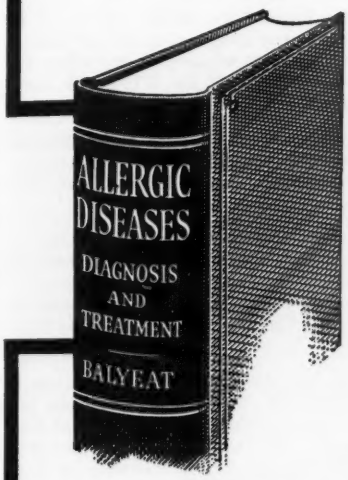

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COUNCIL MEETING

A joint meeting of the Council and the Board of Medical Registration and Examination, was held in Topeka on March 5.

Legislative matters were discussed. All members of the Council and the Board were present.

BLIND PROGRAM

Dr. C. J. Mullen, State Ophthalmologist, Kansas City, Kansas issued the following report for February 1939 pertaining to the Kansas State Board of Social Welfare restoration of sight program:

No. of eye examination reports 1696
No. of applicants approved eligible for Aid to the Blind 1364
No. of applicants not eligible for Aid to the Blind 332

Restoration of Sight Program

No. of cases eligible for treatment 475
No. of cases under treatment 95
83 cases are new
12 cases have completed one authorized treatment
No. of cases authorized treatment has been cancelled.... 8
Total cost of 22 authorized treatments completed during February 1939
Complete cost $1,640.76
Doctor's fees 60.42%
Hospital fees 33.26%
Optical fees 5.39%
Drug fees ..... .91%
Total cost of authorized treatment completed to date $10,797.32
No. of cases completed 136
No. of cases still eligible for Aid to the Blind 44
(12 of these cases have been reauthorized)
No. of cases not eligible for Aid to the Blind after treatment 92

K. C. SOUTHWEST CLINICAL SOCIETY

The Kansas City Southwest Clinical Society sponsored its annual Spring Meeting on March 13 and 14 in Kansas City, Missouri.

Guest speakers for this meeting included Dr. Cyrus C. Sturgis, professor of internal medicine University of Michigan Medical School; Dr. Sumner Koch, associate professor of surgery Northwestern University Medical School, and Majojr General C. R. Reynolds, Surgeon General of the United States Army, Washington, D. C.

The Kansas City Academy of Medicine held their monthly dinner on Tuesday evening, March 14, and had as their guest, Dr. Harry Pratt Smith, professor of pathology State University of Iowa College of Medicine. Dr. Smith's talk was on "Recent Progress in the Study of Hemorrhage".

COUNTY SOCIETIES

The regular meeting of the Clay County Medical Society was held in Clay Center on February 22. Dr. E. S. Wegner, Lincoln, Nebraska, who was the guest speaker on the program, talked on "Pediatric Problems."

The Cloud County Medical Society held a meeting in Concordia on February 22. Election of officers for 1939 was held and the following will serve: Dr. E. R. Gelvin, Concordia, president; Dr. A. M. Townsdin, Jamestown, vice president; Dr. J. M. Porter, Concordia, secretary; and Dr. E. N. Robertson, Jr., Concordia, treasurer.

Dr. R. C. Harner, Howard, was elected president of the Elk County Medical Society at a meeting held in Howard on February 8. Others elected to serve are as follows: Dr. F. K. Day, Longton, vice-president; Dr. F. L. Depew, Howard, secretary-treasurer, and State Meeting Delegate.

Dr. L. C. Joslin, Harper, and Dr. P. G. Miller, Anthony were elected to serve as president and secretary-treasurer respectively of the Harper County Medical Society at a meeting of that society on February 7.

The Kiowa County Medical Society held election of officers for 1939 at their February meeting in Haviland. Those elected are as follows: Dr. James A. McLaughlin, Greensburg, president; Dr. C. D. Updegraff, Greensburg, vice president; Dr. George E. Scheer, Haviland, secretary-treasurer.

Members of the Lyon County Medical Society met in Emporia on February 7. Dr. W. B. Granger, Emporia, presented a paper on "Sinus Trouble, With Discussion of Non-Operative Treatment", and Dr. D. P. Trimble, Emporia, spoke on "Complications and Surgical Treatment of Sinus Disease".

Dr. W. W. Miller, Osborn, was elected president of the Osborne County Medical Society at a recent meeting of that society in Osborne. Dr. J. D. Johnson, Alton, will serve as vice president; and Dr. Andrew P. Brown, Osborne, secretary-treasurer.

The Wyandotte County Medical Society held a meeting on March 7 in Kansas City with the following speakers and their titles respectively: Dr. George A. Walker, Kansas City, presented a Pathological Conference on syphilis; Dr. W. F. Lunsford, Kansas City, presented a motion picture film on syphilis. On March 21 a dinner will be held with Dr. Charles McMartin, Omaha, Nebraka, as the guest speaker. His subject will be "Kidney Tumors."

AUXILIARY

PRESIDENT'S MESSAGE

Dear Auxiliary Members:

As we enter the second half of this Auxiliary year, I want you all to think back and just remember what we have accomplished.

So far this year I am happy to write you that I think you all are making our Kansas Auxiliary very outstanding in the parts you have in all clubs and organizations, and also you are helping maintain the morale of your doctor. How he needs you.

Now, to look forward, plans have been started for our convention in Topeka. We are happy to announce that we think you are all going to enjoy the program, speaker, and the entertainment that is being planned for you, so look forward to the Topeka meeting in May.

I accompanied my husband in January to his convention held in Memphis, Tennessee. How we enjoyed the southern hospitality. I had the pleasure of attending the Memphis

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SOLOMON, P.; MITCHELL, R. S. AND PRINZMETAL, M.: The Use of Benzedrine Sulfate in Postencephalitic Parkinson's Disease —*J. A. M. A.*, 108:1765, May 22, 1937.

FINKELMAN, I. AND SHAPIRO, L. B.: Benzedrine Sulfate and Atropine in Treatment of Chronic Encephalitis— *J. A. M. A.*, 109:344, July 31, 1937.

DAVIS, P. L. AND STEWART, W. B.: The Use of Benzedrine Sulfate in Postencephalitic Parkinsonism, *J. A. M. A.*, 110:1890, June 4, 1938.

MATTHEWS, ROBERT A.: Symptomatic Treatment of Chronic Encephalitis with Benzedrine Sulphate—*Am. J. Med. Sci.*, 195:448, April, 1938.

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*Each 'Benzedrine Sulfate Tablet' contains amphetamine sulfate, 10 mg. (approximately ⅙ gr.). The Council on Pharmacy and Chemistry of the A. M. A. has adopted amphetamine as the descriptive name for α-methylphenethylamine, the substance formerly known as benzyl methyl carbinamine. 'Benzedrine' is S.K.F.'s trademark for their brand of amphetamine.

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Medical Auxiliary meeting and heard their state president, Mrs. H. E. Christenberry, speak to the Auxiliary. A local doctor spoke to them on State Medicine. They had an attendance of one-hundred. Their meetings are held in the mornings and they stay for lunch, a different committee being appointed at each meeting to serve the lunch.

As plans are now I will visit Shawnee, Cloud, Labette, Wilson, Sedgwick, and Ford counties in March.

Mrs. Simonds, Chairman of National Press and Publicity, has written for a news letter from Kansas for the next National News Letter.

Mrs. Frank E. Coffey.

The Sedgwick County Auxiliary Board met at luncheon with Mrs. E. J. Nodurfth, February 6. Assisting hostesses were mesdames E. E. Tippin, A. L. Ashmore, and N. C. Nash.

The Sedgwick County Auxiliary met at luncheon at the Robinson Intermediate School, February 13. Dr. Martin Palmer, guest speaker, gave an address on "Child Speech Defects." The program also included flute selections by Miss Dorothy Goddard: "Minuet" by Mozart and "Wind Among the Trees" by Briccaldi. Miss Ella Rose Wright was accompanist.

The Cloud County Auxiliary held their first meeting of the year, February 8. The chief business of the meeting was the planning for the special program of the Women's Field Army for Cancer Control to be held in Concordia, March 16. Mrs. C. D. Kosar, Cloud County press-publicity chairman of the Auxiliary, is county chairman of the cancer control group. In a sparkling letter Mrs. Kosar announces that the auxiliary appointed two committees, one to care for out of town guests and the other to handle the auxiliary meeting that evening.

The Cloud County Auxiliary played a large part in organizing the St. Joseph's Hospital Auxiliary last autumn. Mrs. Kosar is vice president of the hospital auxiliary. Mrs. Ross Weaver, of the Cloud County Auxiliary, wrote its constitution.

The Labette County Auxiliary met at the home of Mrs. T. D. Blasdel for their January meeting. Mrs. A. C. Baird presented a paper on "Diabetes." Mrs. C. S. McGinnis, chairman Hygeia Committee gave an outstanding report on the years work in that department.

The Labette County Auxiliary calls attention of readers of the Parsons Sun to the radio programs sponsored by the A. M. A. by regularly printed notices in that newspaper, giving the nearest broadcasting station and time of broadcast.

Our National President graciously acknowledges her meeting with the Kansas Board at Hays as follows:

My Dear Mrs. Coffey:

I want you and the other members of Kansas Auxiliary to know how very much I appreciate the many courtesies extended me while attending a meeting of your executive board in Hays.

Believing as I do in the power for good vested in the Auxiliary, it was indeed a pleasure to personally observe the splendid work of you and your co-workers in Kansas.

Thanking you for your kind expressions of good wishes and co-operation, I remain,

Sincerely yours,
Mrs. Charles C. Tomlinson.

This month's report from Sedgwick County again shows the activity of Sedgwick Auxiliary members in lay organizations of Wichita. Many names of members are given as prominently participating in A. A. U. groups, Optimist Club, D. A. R., Twentieth Century Club, library committee of Wesley Hospital, Wichita Child Guidance Centre, Lioness Club, Girl Scouts, Kappa Kappa Gamma, Creighton University Alumni Club, National Guard Dinner, P. T. A.

The Wyandotte County Auxiliary has elected the following officers: Mrs. E. R. Mills, president; Mrs. Lewis G. Allen, vice-president; Mrs. Eugene Reeves, secretary; Mrs. John A. Billingsley, treasurer.

The February meeting of the Wyandotte County Auxiliary was held at the home of Mrs. J. A. Billingsley. After a delightful luncheon the company was entertained by songs by Mrs. E. R. Mills, accompanied by Mrs. L. B. Gloyne, and by an address by Mr. Chester Staton on "Kansas Arts and Artists."

Ford County Medical Auxiliary has placed Hygeia in fifteen grade schools in their district this year and have voted to place the magazine in the rural schools for six months period, beginning, September, 1939.

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   Minerals . . . 0.8%
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2. **Q.** What are the Karo equivalents?

   A. *1 oz. vol. . . 40 grams 120 cals.*
   1 oz. wt. . . 28 grams 90 cals.
   1 teaspoon . . 15 cals.
   1 tablespoon . 60 cals.

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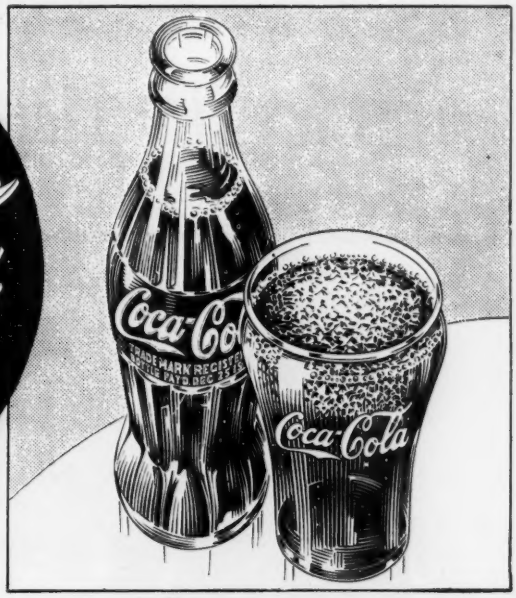

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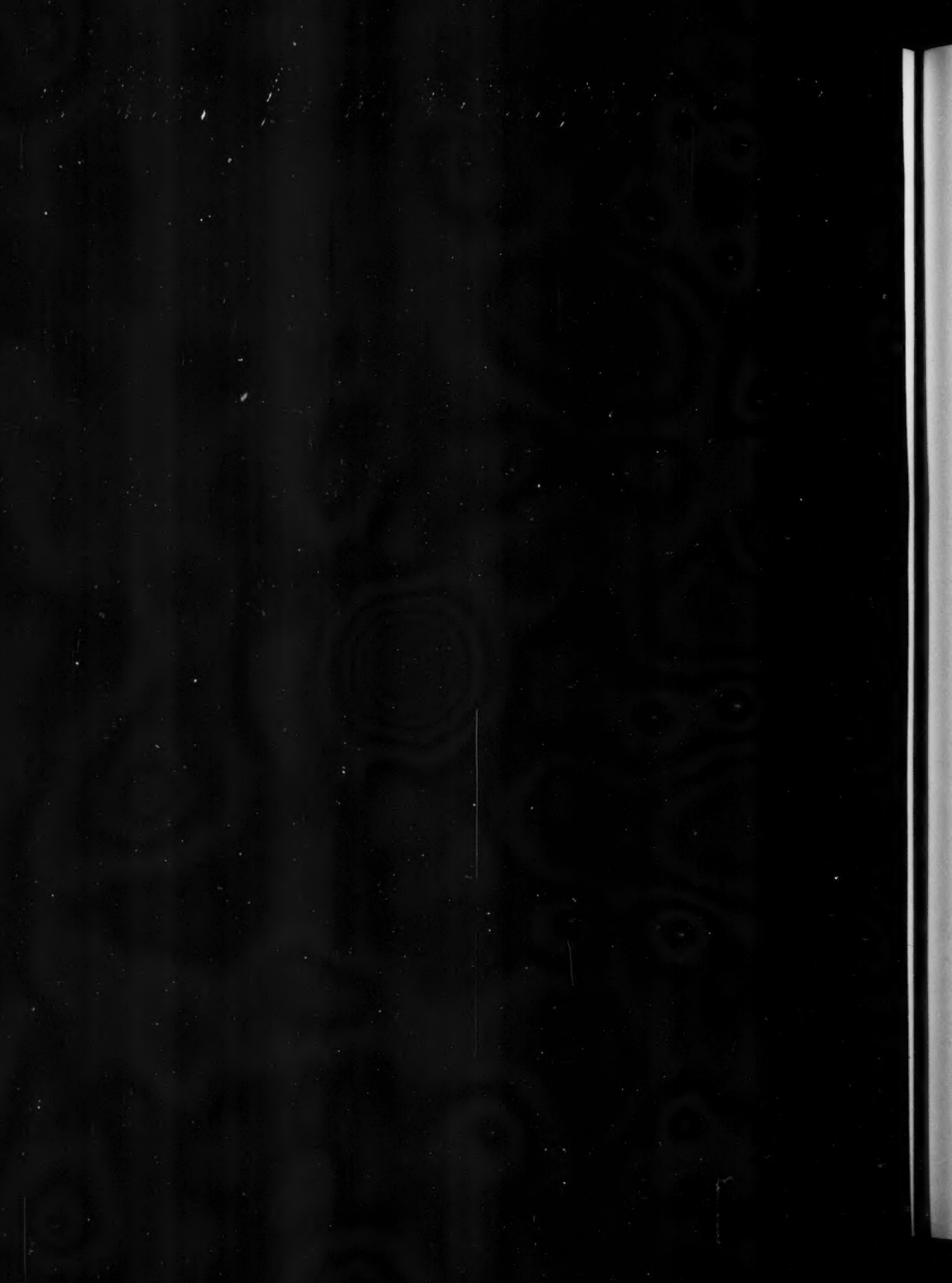

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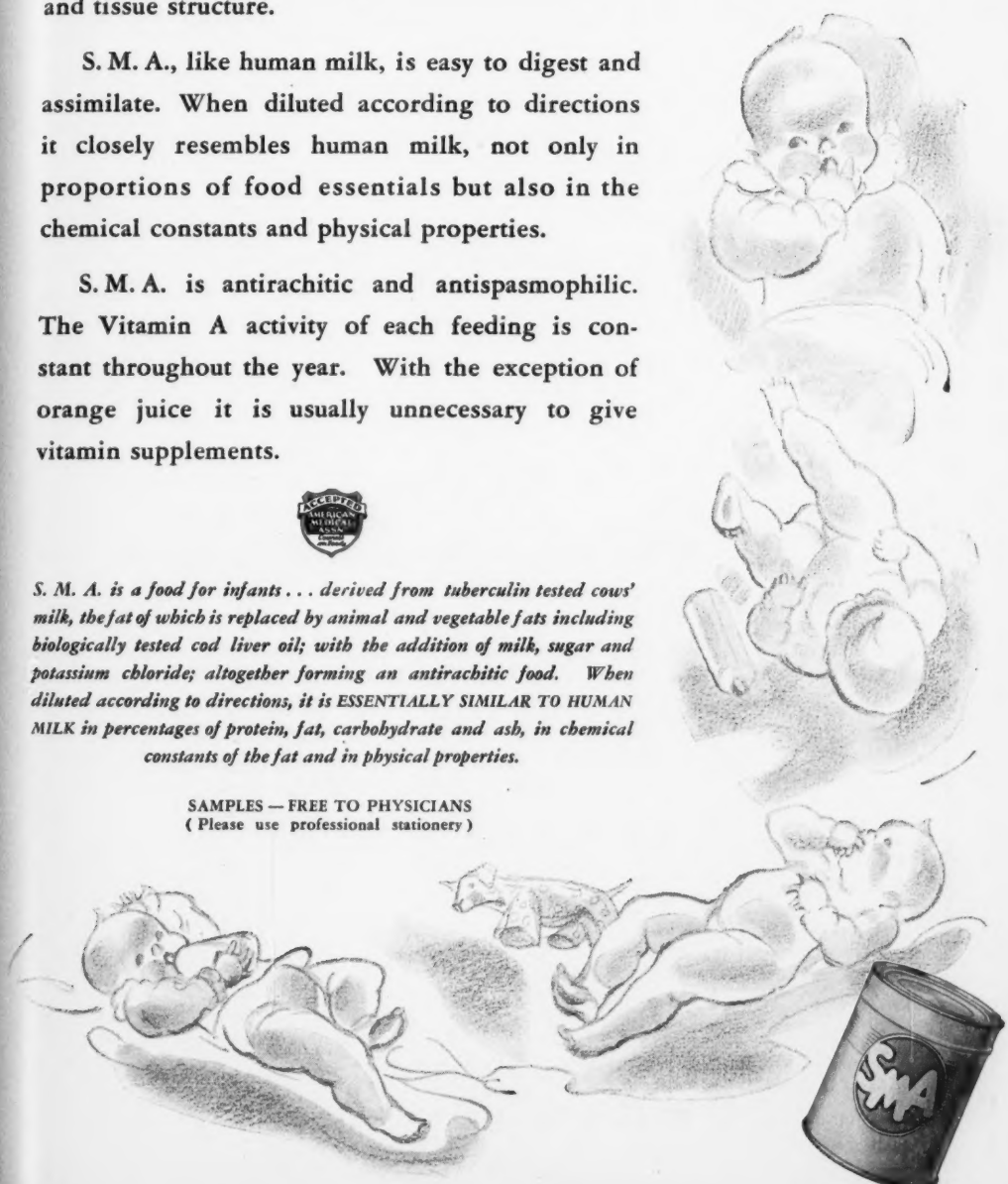

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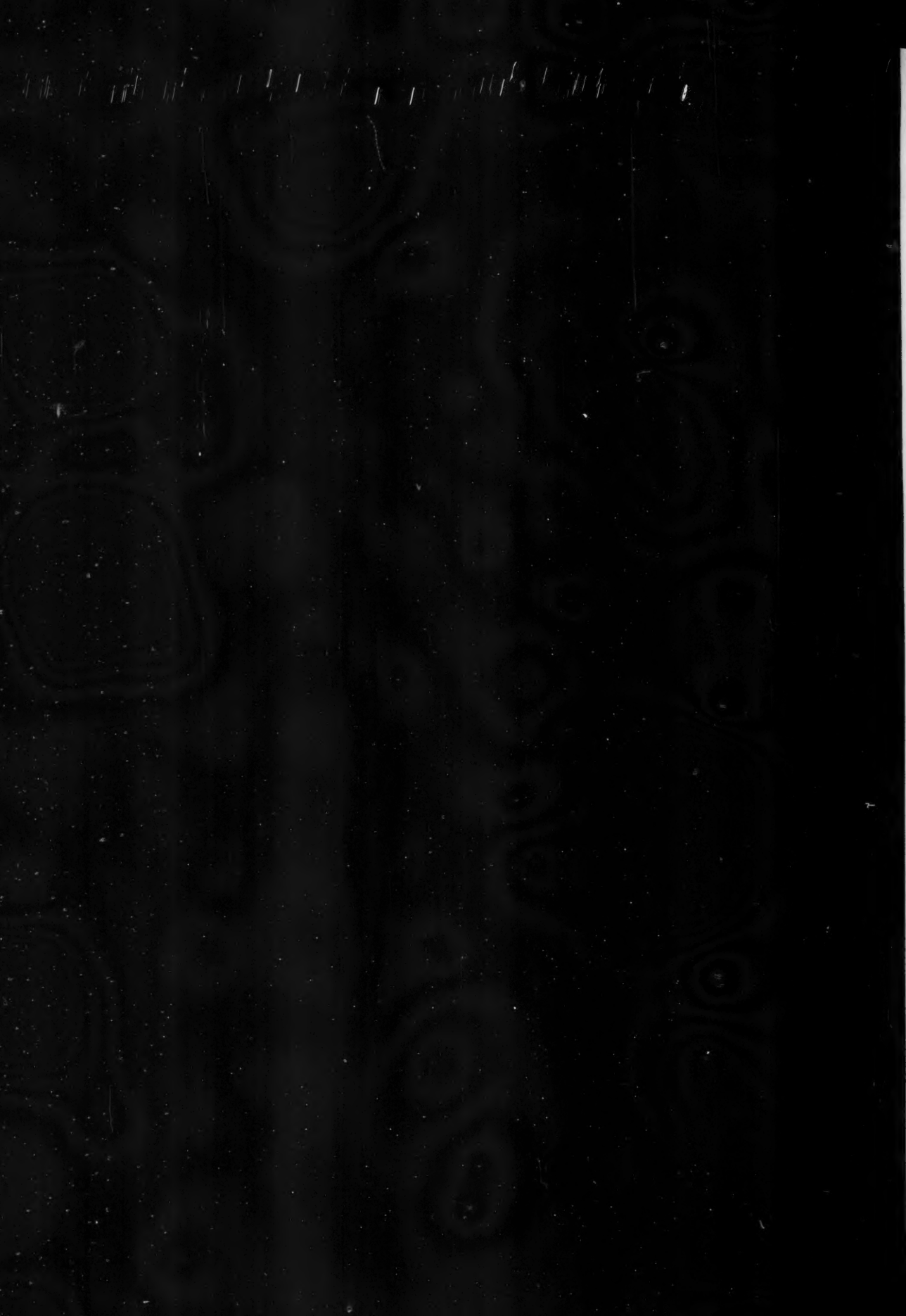
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